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ABSTRACT

The Intergovernmental Oceanographic Commission was organized by Unesco to promote scientific investigation with a view to learning about the nature and resources of the oceans through the concerted action of its members. This report contains a summary of the discussions that took place at the 14th session of the Commission. This includes the traditional Bruun Memorial Lectures (abstracts of which are included in the appendix). The major portions of this document summarize the discussions that dealt with: (1) administrative arrangements of the session; (2) the recent activities of the commission; (3) ocean sciences (as they relate to living and non-living resources, ocean mapping, ocean dynamics and climate, and marine pollution research and monitoring); (4) ocean services; (5) regional subsidiary bodies; (6) cooperation with other organizations of the United Nations system and with other bodies; (7) medium-term plan, program and budget; (8) enhancing the role of the Commission; and (9) elections of the officers and Executive Council of the Commission. The 20 resolutions adopted by the Commission are provided in the appendix, along with the texts of the three general addresses. (TW)

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Intergovernmental Oceanographic Commission
Reports of Governing and Major Subsidiary Bodies

ED286747

Fourteenth Session of the Assembly

Paris, 17 March-1 April 1987

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THE INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION

was established within Unesco in November 1960

The functions of the Commission are to:

(a) define those problems the solution of which requires international co-operation in the field of scientific investigation of the oceans and review the results of such investigation;

(b) develop, recommend and co-ordinate international programmes for scientific investigation of the oceans and related services which call for concerted action by its members;

(c) develop, recommend and co-ordinate with interested international organizations, international programmes for scientific investigation of the oceans and related services which call for concerted action with interested organizations;

(d) make recommendations to international organizations concerning activities of such organizations which relate to the Commission's programme;

(e) promote and make recommendations for the exchange of oceanographic data and the publication and dissemination of results of scientific investigation of the oceans;

(f) make recommendations to strengthen education and training programmes in marine science and its technology;

(g) develop and make recommendations for assistance programmes in marine science and its technology;

(h) make recommendations and provide technical guidance as to the formulation and execution of the marine science programmes of the United Nations Educational, Scientific and Cultural Organization;

(i) promote freedom of scientific investigation of the oceans for the benefits of all mankind, taking into account all interests and rights of coastal countries concerning scientific research in the zones under their jurisdiction.

In carrying out its functions, the Commission is required to bear in mind the special needs and interests of developing countries including in particular the need to further the capabilities of these countries in marine science and technology.

Nothing in the above shall be construed as implying the expression of a position regarding the nature or extent of the jurisdiction of coastal States in general or of any coastal State in particular.

(Statutes, Article 2, November 1970)

In addition to the above, the Commission has a further function which is to act as an effective joint specialized mechanism operating on behalf of certain organizations of the United Nations system substantially concerned with oceanic programmes (United Nations, Unesco, FAO, WMO and IMO), under an agreement developed by the Inter-secretariat Committee on Scientific Programmes Relating to Oceanography (ICSPRO).

Intergovernmental Oceanographic Commission
Reports of Governing and Major Subsidiary Bodies

Fourteenth Session of the Assembly

Paris, 17 March-1 April 1987

Unesco

SC/MD/86
Paris, 12 June 1987
Original: English

In this Series

Reports of Governing and Major Subsidiary Bodies, which was initiated at the beginning of 1984, the reports of the following meetings have already been issued:

		Languages
1.	Eleventh Session of the Working Committee on international Oceanographic Data Exchange	E,F,S,R
2.	Seventeenth Session of the Executive Council	E,F,S,R,Ar
3.	Fourth Session of the Working Committee for Training, Education and Mutual Assistance	E,F,S,R
4.	Fifth Session of the Working Committee for the Global Investigation of Pollution in the Marine Environment	E,F,S,R
5.	First Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions	E,F,S
6.	Third Session of the *ad hoc* Task Team to Study the Implications, for the Commission, of the UN Convention on the Law of the Sea and the New Ocean Regime	E,F,S,R
7.	First Session of the Programme Group on Ocean Processes and Climate	E,F,S,R
8.	Eighteenth Session of the Executive Council	E,F,S,R,Ar
9.	Thirteenth Session of the Assembly	E,F,S,R,Ar
10.	Tenth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific	E,F,S,R
11.	Nineteenth Session of the Executive Council	E,F,S,R,Ar
12.	Sixth Session of the IOC Scientific Committee for the Global Investigation of Pollution in the Marine Environment	E,F,S
13.	Twelfth Session of the IOC Working Committee on International Oceanographic Data Exchange	E,F,S,R
	Second Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions	E,F,S
14.	First Session of the IOC Regional Committee for the Central Eastern Atlantic	E,F,S
15.	Second Session of the IOC Programme Group on Ocean Processes and Climate	E,F,S
16.	Twentieth Session of the Executive Council	E,F,S,R,Ar

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PREAMBLE

"The purpose of the Commission is to promote scientific investigation with a view to learning more about the nature and resources of the oceans through the concerted action of its members." (Statutes, Article 1, paragraph 2).

The Commission held the Fourteenth Session of its Assembly in Unesco Headquarters in March 1987. Delegates from 86 Member States and representatives from 23 intergovernmental and non-governmental bodies attended.

This Report contains a summary of the discussions that took place during the session. The 20 Resolutions adopted are given in full in Annex II.

During the session, the traditional Bruun Memorial Lectures were presented; this year the theme was Regional Co-operative Marine Science. Abstracts are given in Annex V. The full lectures will be published in the IOC Technical Series.

With a few exceptions, the decisions and actions internal to the Commission have been incorporated into the body of the summary report; the relevant paragraphs have been marked by the symbol:

D for decisions on policy, and

▲ for calls for action (e.g. by the Member States, the governing and subsidiary bodies, the Secretary, etc.) required to give effect to policy. Obviously, the distinction is not always clear-cut.

Expressions of general approval or of appreciation are not marked, except that all the positions taken by the Assembly are indicated by underlining in the text of the Report.

During the period covered by this report, i.e. from the end of the Thirteenth Session of the Assembly (28 March 1985) until the end of the Fourteenth Session of the Assembly (1 April 1987) including the Nineteenth and Twentieth Sessions of the Executive Council:

(a) the following served as Officers of the Commission:

Chairman: Professor Inocencio A. Ronquillo (Philippines)

First Vice-Chairman: Mlle M.A. Martin-Sané (France)

Second Vice-Chairman: Dr. J.A. Galavis-Seidel (Venezuela)

Third Vice-Chairman: Professor Dr. sc. Klaus Voigt (German Democratic Republic)

Fourth Vice-Chairman: Dr. S. Allela (Kenya)

(b) the following served as State-Member Representatives on the Executive Council:

A. Chouikhi	Algeria
D. Van Dunem	Angola
S.R. Olivier	Argentina
D.G. Keeley	Australia
J. do Texeira de Carvalho	Brazil
B. Ormanov	Bulgaria
N.J. Campbell	Canada
Luo Yuru	China
M.M. Murillo	Costa Rica
G.F. Zabi Soko	Cote d'Ivoire
K.V. Hansen	Denmark
G. Hempel	Germany (Federal Republic of)
A.R. Bayoumi	Egypt
C. Kribas	Greece
S.Z. Qasim	India
A. Soegiarto	Indonesia
N.A. Hussain	Iraq
C. Morelli	Italy
T. Nemoto	Japan
A. Ayala-Castañares	Mexico
J.G. Tobor	Nigeria
J.M. Bakula	Peru
D.Y. Kane	Senegal
T. Pongsapipatt	Thailand
T.I. Balkas	Turkey
D.P.D. Scott	United Kingdom
E.I. Tolstikov	Union of Soviet Socialist Republics
P.M. Wolff	United States of America

A list of the new officers of the Commission and State-Member Representatives on the Executive Council who will serve until the end of the Fifteenth Session of the Assembly (March 1989) is given in Annex IV to this Report.

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1. OPENING

The Chairman, Professor Inocencio Ronquillo, opened the Fourteenth Session of the IOC Assembly at 10.00 on 17 March 1987. 1

The Chairman expressed his pleasure in addressing the Assembly on this occasion. He also expressed to the Director-General of Unesco, Mr. Amadou Mahtar M'Bow, his deep appreciation of the support and personal attention given by the Director-General to the affairs of the Commission in a period of special difficulty for all. He thanked the Assistant Director-General for Science, Dr. Abdul-Razzak Kaddoura, for his help in advancing the Commission's work. 2

The Chairman then briefly reviewed the changes in the Commission's role and work since he was first elected in 1982. Many of the major programmes of the IOC have taken ten years or longer to be well established, after having passed through the stages of planning, acceptance and active implementation; within the ocean sciences, the Global Investigation of Pollution in the Marine Environment and Ocean Mapping are examples. The newer programmes, Ocean Dynamics and Climate, and Ocean Science in Relation to Living and Non-Living Resources, are now maturing at a much quicker pace than the earlier and older programmes. 3

The Ocean Services of the Commission have been pioneers in their respective fields and are indeed unique in many respects. They are now entering a period of considerable acceleration, and some are approaching the operational level. With the benefit of this experience, the ever-pressing demands of Member States for reliable prediction of natural events in the marine environment and their interaction with the atmosphere, the Commission's newer programmes are developing faster than the older programmes did. However, the newer programmes are still mainly in the planning phase. 4

The Commission's regional subsidiary bodies are appropriate mechanisms for dealing with specific regional marine scientific problems, and in implementing regional components of the major global programmes. Also, in the last few years, there has been an increase in the level of co-operation between the Organizations members of ICSPRO and the Commission, and the Chairman expressed the hope that, in the near future, other UN organizations will seriously consider becoming parties to the ICSPRO Agreement. 5

The Chairman briefly reviewed some of the problems with which the Commission has been faced. Member States have increased their expectations and their demands of the Commission without a commensurate allocation of resources. The Commission has undertaken, in the last few years, several longer-term multi-disciplinary scientific research programmes, which require longer-term commitments than ever before. Such commitments go well beyond even the UN system's Medium-term Plan schedule of six years. This uncertainty in resources seriously hampers the Commission's ability to undertake the obligations facing it - to Member States, to the other organizations with which it must and does collaborate, and to the international scientific community. This is a major challenge that Unesco and the Member States should face. 6

7 The budgetary constraints affecting Unesco, which have forced a serious reduction in the staff of the Commission's Secretariat, has brought upon the Secretary and the staff for some years now an extremely heavy workload which they have borne with devotion and goodwill. Even with the assistance of experts seconded to the Commission by the Member States, and the staff provided by FAO and WMO under the ICSPRO Agreement, the personnel available to the Secretariat of the Commission does not cover at present some key marine scientific disciplines nor is it quantitatively adequate to provide the required servicing and technical backstopping of the approved programmes.

8 The Chairman appealed to the Director-General to help the Commission to overcome this particularly critical period and prepare itself to respond adequately to the growing demands of the Member States and of the world community. To this end, the Commission has given considerable study to the need to amend its Statutes to reflect better its role and functions within Unesco so as to prepare it for the year 2000 and beyond, including ways and means of ensuring the stability and continuity of its resources.

9 The Chairman thanked his fellow Officers, his predecessor, the Member States and the Secretariat for their generous support in the conduct of the business of the Commission and wished his successor and the future Officers every success in what must surely be one of the most exciting periods of the Commission's history.[1]

10 The Chairman called on the participants to stand in silence for one minute, to mark the death, since the Thirteenth Session, of distinguished scientists who had collaborated with the Commission or had been concerned with marine science.

11 The Chairman then invited the Director-General to address the Assembly.

12 The Director-General warmly welcomed the participants. He recalled that Unesco, since its very beginning had shown a continuous wish to contribute to the strengthening of international co-operation in the marine sciences and to the development of its Member States. The Commission was born of such co-operation, notably with the International Council of Scientific Unions, the UN, FAO, WMO and IAEA, to which he wished to pay tribute.

13 From a beginning of 42 Member States, which all gave a high priority to oceanography, the Commission has grown to 115 Member States, and this growth has been favoured by the actions of Unesco itself through the work of the Division of Marine Sciences. The risk originally taken in creating the Commission has therefore been justified, since it has proven an effective mechanism that plays a leading role in the UN system, as a whole, and in the context of ICSPRO, in particular.

14 The importance of international co-operation in the marine sciences justifies the allocation of increased resources. The severe budget

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[1] The Chairman's statement in full is given in Annex III-A, hereto.

cuts and, therefore, staff cuts, has affected Unesco as a whole, but the Organization has been able to limit the effects of these cuts. Moreover, the increased involvement of the Member States, especially through the Commission, has brought invaluable support. Nevertheless, the application of the principle of zero growth in the Organization's regular budget is a severe constraint.

The Director-General offered to support, at the General Conference of Unesco, any proposal of this Assembly to increase the resources of the Organization beyond zero growth. This, however, depends on the Member States themselves, but could be envisaged in the preparation of the Medium-term Plan 1990-95. The role of the oceans should be especially emphasized therein; the Director-General said he would welcome the views of the Commission in this matter. 15

Unesco intends to continue to promote the scientific knowledge required for the rational exploitation of marine resources and the effective protection of the oceans, but it must also offer users of the sea increasingly sophisticated and diverse ocean services. The Commission's guidance in this sense will be taken into account, in the light of the resources made available to the Organization. 16

This will, in any case, require enhanced co-ordination of the programmes of the Commission with those of the Division of Marine Sciences. This effort will bear particularly on the implementation of the Comprehensive Plan for a Major Assistance Programme to Enhance the Marine Science Capabilities of Developing Countries. This Plan has been well received by the Member States and will be a priority task for Unesco in the coming years. 17

The Director-General especially thanked the Chairman, Prof. Ronquillo, and the First Vice-Chairman, Ms. Marie-Annic Martin-Sané, for their selfless contributions in the service of the Commission at all times during their two statutory periods of office. 18

The Director-General wished the Assembly every success in its work at this Session.[1] 19

The Chairman then invited the Under-Secretary-General of the UN, Special Representative of the Secretary-General of the United Nations for the Law of the Sea, Mr. Satya Nandan, to address the Assembly. 20

The Under-Secretary-General recalled that the United Nations Secretariat has for years maintained a very close and fruitful working relationship with the Commission. However, it was the first time that he had personally been able to attend a Session of the Assembly. He particularly welcomed this in view of the significant progress in the acceptance by the international community of the new régime of the ocean and the importance of the challenges confronting the organizations and bodies of the United Nations system in assisting States to implement the provisions of the UN Convention on the Law of the Sea. The Convention not only 21 establishes the legal framework for all activities in the marine environment but also represents one of the most important conflict-prevention measures adopted by the international community.

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[1] The Director-General's statement in full is given in Annex III-B, hereto.

22 The Convention recognizes that all activities in the ocean space are interrelated, since activities of one kind impact on other activities, in the marine environment. This calls for an integrated system of ocean management by States.

23 The Convention calls for co-operation among all States in its implementation; such co-operation contributes not only to their economic development and the enhancement of the quality of life of their peoples, but also to the maintenance of peace and security among nations.

24 Knowledge and information derived from marine scientific research play a key role in the successful management of the ocean, and are a prerequisite for rational resource exploitation and control of marine pollution. Since more than 90 per cent of the living resources and all of the presently exploitable non-living resources of the oceans are to be found in the Exclusive Economic Zones of Member States, marine scientific research is of particular importance to the development of these Zones.

25 The organizations and bodies within the United Nations system have a collective responsibility in matters relating to the oceans and each institution in its own field of competence has to fulfil part of this responsibility.

26 Beyond its value as a means for increasing mankind's understanding of the global environment, marine scientific research provides the necessary data and information on which the uses of the sea and its resources are based. It is with this awareness that Part XIII of the Convention dealing with Marine Scientific Research stresses the need for the scientific community to obtain authorization from the coastal State whenever research in its Exclusive Economic Zone or its continental shelf is envisaged.

27 The Under-Secretary-General informed the Assembly that his Office is co-operating closely with the Commission in addressing this subject jointly. This co-operation will lead to the convening of a first workshop to analyse the practice of States and determine the major problems that exist at this time and those that may evolve in the future in this regard. His Office is also co-operating closely in the publication of documents containing a compilation of all national legislation relating to marine scientific research.

28 Another area where the Law of the Sea Secretariat intends to co-operate closely with the Commission is in the study of the concept and possible modalities of promoting national and regional marine scientific research and technological centres; this is an area where, again, our respective activities can complement each other to the benefit of our Member States.

29 The Under-Secretary-General recalled that the fundamental objective of the United Nations and the organizations within the system is to ensure a coherent approach to the implementation of the new régime and to provide assistance to all Member States in order for them to maximize the

benefits to be derived from the ocean.[1]

2. BRUUN MEMORIAL LECTURES

The First Vice-Chairman, Ms M.A. Martin-Sané, introduced the Bruun Memorial Lectures on the afternoon of Tuesday, 17 March 1987, on the theme of regional co-operative marine science. 30

The speakers and their lectures were: 31

- Sea-level Changes, Environment, Tectonics and Resources, by Dr. Peter J. Cook (Australia)
- Monsoon and Currents in the Indian Ocean, by Dr. Michèle Fieux (France)
- The Scientific Basis for the Assessment of Marine Pollution in Caribbean and Adjacent Regions: the CARIPOL experience, by Dr. Jorge E. Corredor (USA)

The speakers responded to invited comments and questions from the floor. 32

Abstracts of the Lectures are given in Annex IV, hereto. The full texts, including an account of the discussions, will be published in the IOC Technical Series in due course. 33

Regarding the choice of Bruun Memorial Lectures for the Fifteenth session of the Assembly, the Secretary reminded the Assembly of the proposal of the Technical Committee on Ocean Processes and Climate that the theme be the impact of new technology on marine scientific research. 34

The Assembly accepted this suggestion and called on the First Vice-Chairman to study, in consultation with the other Officers of the Commission and the Secretary, the fields to be covered and to identify the speakers. 35

3. ADMINISTRATIVE ARRANGEMENTS

The Chairman recalled that the Executive Council had met for one day, on 16 March 1987, as the Steering Committee for the Assembly, and had reviewed the arrangements therefore; he drew attention to the Summary Report of the Executive Council (Document IOC/EC-XX/3). 36

3.1 ADOPTION OF THE AGENDA

The Secretary informed the Assembly of the recommendations of the 37

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[1] The Under-Secretary-General's statement in full is given in Annex III-C, hereto.

Executive Council, acting as the Steering Committee for the Assembly, with respect to the Provisional Agenda of the Assembly: (i) Since the Chairman of the IOC Consultative Group on Ocean Mapping will introduce all of Agenda Item 5.3 (Ocean Mapping), the Sub-items 5.3.1 (General Bathymetric Chart of the Oceans) and 5.3.2 (Regional Bathymetric Chart Projects) could be absorbed into 5.3; (ii) In view of the discussions at the Sixth Session of the Scientific Committee for GIPME on the interest of promoting a study of ocean fluxes and on a recent expert consultation organized by SCOR on this subject, which will have important implications for the Commission, a new Agenda Item, 5.5.4 (Global Ocean Flux Study), may be added; (iii) The Director of the UNEP Oceans and Coastal Areas Programme Activity Centre requested a new Sub-item, 8.3 (Co-operation with the UN Environment Programme; and (iv) The work of the Joint CCOP-IOC Working Group on Post-IDOE Studies of East Asian Tectonics and Resources (SEATAR) and the Joint CCOP(SOPAC)-IOC Working Group on South Pacific Tectonics and Resources (STAR) appear under Agenda Item 7.2 (Programme Group for the Western Pacific) in the Provisional Agenda but are in fact independent of it, even if relevant to WESTPAC; they should be considered under a separate new Agenda Item, 7.5 (STAR and SEATAR).

38 The Assembly agreed with these changes, and adopted the Agenda as amended. It is attached as Annex I, hereto.

3.2 DESIGNATION OF THE RAPPORTEUR

39 The Delegate of Turkey proposed Dr. G. S. Quraishee, of Pakistan, as Rapporteur for the Session. Several Delegates (China, Kenya, Japan) seconded this proposal.

40 The Assembly designated Dr. G. S. Quraishee Rapporteur for its Fourteenth Session.

3.3 CONDUCT OF THE SESSION, TIMETABLE AND DOCUMENTATION

41 The Chairman informed the Assembly of the composition of the Nominations Committee for the Fourteenth Session, pursuant to Rule of Procedure Nº 12(2): Poland (Chairman), Angola, Argentina, Denmark, Germany Federal Republic of, Thailand, USSR and USA.

42 He then informed the Assembly that the Executive Council had recommended to the Assembly the following composition of the Resolutions Committee: Costa Rica (Chairman), Algeria, Brazil, China, France, India, Japan, Nigeria, Sweden, USSR, UK and USA.

43 The Assembly accepted this Recommendation and so constituted the Resolutions Committee for its Fourteenth Session.

44 The Secretary explained the decisions taken by the Executive Council with respect to the functions of the Resolutions Committee which was asked to deal with Draft Resolutions in their original language only or, if that was not practical, in an official English translation before they were submitted for formal translation into the four working languages of the Commission for consideration in Plenary.

The Secretary then described the implications of the Agenda changes for the Timetable. 45

The Assembly agreed with the Secretary's proposals. 46

The Secretary briefly outlined the documentation for the Session, and reminded the Assembly that, as far as possible, it should work in Plenary, although the ad hoc Sessional or Drafting Groups could be formed to deal with particularly complex issues. 47

Some Delegates asked the Secretary to so set work priorities as to ensure that at least certain key documents (e.g., Action Paper, the Biennial Report, the Secretary's Report, and Programme and Budget Documents) were distributed to the Member States in all working languages sufficiently in advance of an Assembly Session. 48

4. REPORT ON ACTIVITIES OF THE COMMISSION

4.1 SECRETARY'S REPORT ON INTERSESSIONAL ACTIVITIES

In summarizing his Report on Intersessional Activities (Documents IOC-XIV/6 and 6 Suppl.), the Secretary highlighted several important events that had taken place since the Nineteenth Session of the Executive Council. Progress in programme implementation can be considered generally satisfactory, especially in the perspective of providing building blocks towards the future when, it is hoped, the Commission will have at its disposal the financial and staff resources needed to carry out all its programmes and activities at the required level. 49

Many of the goals forecast in 1986 have been attained. Others are moving forward, but at a slower pace than anticipated, and a few are noticeably behind schedule, largely due to limitations in financial and staff resources. In Ocean Science, on the positive side, the programme of Ocean Dynamics and Climate has advanced substantially in respect of the planning of activities; the Global Investigation of Pollution in the Marine Environment has moved to the operational phase with the involvement of a broader range of Member States co-operating in the implementation of its regional components. 50

Staffing in support of marine pollution research and monitoring activities remains a source of concern, although provision of three Associate Experts, two by the Danish Government to work in the Secretariat, and a third by Sweden, attached to the IOC Secretariat for IOCARIBE, will help to alleviate the situation. 51

On the other hand, the continued lack of specialized personnel in the Secretariat for Ocean Science in Relation to Non-Living Resources (OSNLR) is a limiting factor in the servicing of the programme and in the mobilization of required support and funding beyond that which the Commission can provide within its regular budget. Although some preliminary negotiations are underway on possible seconded staff for the programme, reactivation of the post foreseen for this position and placed in reserve is a high priority. The Secretary recalled the highly positive results of the 52

Second Session of the IOC-UN(OETB) Guiding Group of Experts on OSNLR, including the wide-ranging proposals to achieve the goals of the programme, especially at the regional level. Additional funds and staff are essential to implementation of the Guiding Group's recommendations.

53 The activities in the field of Ocean Mapping are moving forward more quickly than in the previous intersessional period. The arrival of a staff member seconded by the USSR to assist in the Ocean Mapping programme and a USSR expert working at the IOC-ICSEM Operational Unit in Monaco has considerably assisted in advancing this programme. The preparation of regional bathymetric charts is progressing satisfactorily, notably with the launching of a project for an International Bathymetric Chart of the Caribbean Sea and Part of the Pacific Ocean off Central America (IBCCA), and an International Bathymetric Chart of the Central Eastern Atlantic (IBCEA). The preparation of geological/geophysical map series for the International Bathymetric Chart of the Mediterranean and Overlay Sheets (IBCM) is progressing well. Planning for the preparation of a Sixth Edition of the General Bathymetric Chart of the Oceans (GEBCO) is under active study. Overall management of the Ocean Mapping programme through the IOC Consultative Group on Ocean Mapping, on which the various relevant IOC subsidiary bodies (Editorial Boards, etc.) are represented, is a new approach to co-ordination and may eventually serve as an example for other fields of endeavour within the Commission's programme.

54 Ocean Services have generally undergone substantial development during 1986. Operational aspects of the development of services such as the IOC Global Sea-Level Observing System (GLOSS) and the IOC-WMO Integrated Global Ocean Services System (IGOSS) have been strengthened, with special attention given to new requirements of the scientific community and IOC programmes as a whole. The development of GLOSS has benefitted from the services of an expert seconded by the USSR and support, through training courses, from the United Kingdom. The IGOSS Operations Co-ordinator, seconded by the United States, has helped to promote the ship-of-opportunity programme which contributes to IGOSS.

55 The conclusions of the Twelfth Session of the Technical Committee on International Oceanographic Data Exchange (IODE) are worthy of particular note since they represent an important evolutionary step in the adaptation of data and information management systems to the challenges being presented by new technology and major international marine science programmes. The plans forecast by the Committee for execution over the next few years, many of which need to be moved forward rapidly, will generate additional staff, and funding requirements, including funding from extra-budgetary resources, especially in view of the enlarged mandate of the Committee which now covers marine scientific information management, which is an area of high priority for developing countries.

56 To assist in the assessment of the trends in various programmes, scientific or technical consultations were held immediately prior to the sessions of the major scientific, technical and regional subsidiary bodies. The conclusions arising from these consultations show that regional implementation of the global science programmes and service activities is a key element in ensuring the participation of the largest possible number of Member States in the work of the Commission, as well as the desirable feed-

back between the global and regional thrusts of the programmes which should be mutually reinforcing.

The Secretary noted the recent successful Sessions of the IOC Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE) and of the IOC Regional Committee for the Central Eastern Atlantic (IOCEA), and reported that arrangements were underway for forthcoming Sessions of the Regional Committee for the Western Pacific (WESTPAC), IOC Regional Committee for the Co-Operative Investigations in the North and Central Western Indian Ocean (IOCINCWIO) and IOC Regional Committee for the Central Indian Ocean (IOCINDIO). He recalled that it had been necessary to outpost the IOC Senior Assistant Secretary (Ocean Science) to fill the post of Senior Assistant Secretary for IOCARIBE to respond to the expanding activities in the region and to the kind offer of the Government of Colombia to host the IOC Secretariat for the Sub-Commission. The Secretary noted that the formal agreement between Unesco and Colombia was now being finalized, and appreciated the interim arrangements made by Colombia for the Secretariat in Cartagena. The Ocean Science Unit in IOC, however, is now seriously understaffed and the rectification of this situation should be given high priority. 57

Referring to Training, Education and Mutual Assistance in the Marine Sciences (TEMA), the Secretary emphasized the considerable extra-budgetary funding that had recently been generated: about two million dollars, in cash and kind. These funds are applied to training activities, national development projects and arrangements under the IOC Voluntary Co-operation Programme (IOC-VCP). The Secretary announced that the first Marine Science Country Profile (for Malta) had been finalized and that others for Jamaica and Portugal were at an advanced stage of preparation. 58

Regarding implementation of the Unesco-IOC Comprehensive Plan for a Major Assistance Programme to Enhance the Marine Science Capabilities of Developing Countries, extra-budgetary resources have been mobilized, largely through the Division of Marine Sciences. Although the number and level of implementation of these projects is still below that considered to be sufficient to achieve the long-term goals forecast in the Plan, the concerted action of IOC and Unesco (mainly through the Division of Marine Sciences and the Regional Offices of Science and Technology), with a view to mobilizing the necessary extrabudgetary funds through, inter alia, national and international funding agencies, is expected to raise the implementation to a more adequate level. 59

Despite the laudable performance of Secretariat staff, many of whom contribute far more than the normal working hours to their duties, it is obvious that the programme as a whole cannot be adequately serviced with the present manpower. The Secretary felt obliged to alert the Assembly to the probable negative implications of this situation for the work of the Commission, the future development of which should be planned bearing in mind the availability of resources. 60

The Secretary referred to certain difficulties that had been encountered in the production and despatch of documents to Member State institutions involved in IOC activities. He noted that this was an area where the reduced staffing and funding of Unesco itself had affected the work of the Secretariat. The Secretary expressed his appreciation of the 61 special efforts made by Unesco to respond to IOC needs, noting that the Commission's requirements for document production represented a considerable portion of that assigned to the whole of the Science Sector. He hoped that the introduction of modern office technology, a modest foundation for which had been laid, would eventually rectify some of these problems. He expressed his appreciation to the United States for their assistance in providing expert advice in support of this endeavour.

62 Co-operation with the Organizations members of ICSPRO continued to grow in the intersessional period, and co-operation with UNEP is entering a phase of consolidation and expansion. Working relationships with other international and regional organizations and bodies are developing in a satisfactory manner.

63 The expressed his deep appreciation to the Assistant Director General of Unesco for Science, not only for his continued support but also for his wise guidance and assistance in helping to arrive at solutions to a number of issues related to the special situation of IOC as an intergovernmental body within Unesco. He particularly emphasized the importance of avoiding the disrupting effects on the plans of Member States and co-operating Organizations which occur when anticipated action has to be postponed or falls behind schedule.

64 Many Delegates expressed their appreciation of the quality and comprehensiveness of the Report and congratulated the Secretary and staff on the work accomplished during the intersessional period. While recognizing the dedication of the Secretariat, they drew attention to the urgent need to reinforce the present level of personnel, since the present staff cannot ensure indefinitely the proper functioning of the Commission which is undergoing strong development. Several Delegates stressed the global character of certain scientific phenomena and the necessity of developing, in parallel, the scientific research programmes and the ocean services.

65 Referring to programmes of special interest to their countries, numerous Delegates emphasized the encouraging progress being made in regional implementation of the agreed programme and the need to give particular attention in the future to strengthening the regional subsidiary bodies of the Commission to enable them to implement effectively the Commission's programmes, including support to developing countries under TEMA and other appropriate arrangements. One Delegate emphasized the need to make a special effort to assist the development of IOCINCWIO.

66 The Delegate of Japan, referring also to the above-mentioned in-depth study, expressed her regret that the new Guidelines on the Structure and Responsibilities of the Subsidiary Bodies of the Commission arising from the deliberations thereon at the Nineteenth Session of the Executive Council had not been made available to the Assembly for approval.

67 The Secretary, responding to observations made on his Report, expressed appreciation on behalf of the staff for the words of encouragement from the Assembly. He was pleased to note the offers of collaboration and support that had been made and the high degree of interest of Member States in the work of regional bodies. Referring to plans being made for the Fifth Session of the Technical Committee for TEMA, forecast for 1988, at the UN Headquarters in New York, he informed the Assembly that a Seminar or

Workshop will be arranged to precede the Session with the aim of reviewing progress and trends in TEMA, the requirements of developing Member States and regional needs, and ways by which the required extra-budgetary resources could be mobilized, including support for national, regional and sub-regional assistance projects under the Unesco-IOC Comprehensive Plan.

The Assembly accepted the Report of the Secretary on Inter-sessional Activities. 68

The Secretary reminded the Assembly that the Executive Council, at its Nineteenth Session, when considering the in-depth study on the present structure of the Commission, recommended that the Assembly abolish the Scientific Review Board (SRB). The Executive Council had recognized that (Document IOC/EC-XIX/3, paragraph 284), "since the creation of the Scientific Review Board, a number of IOC programme formulation and review mechanisms for specific programmes had evolved, notably the IOC Working Committees and Guiding Groups of Experts (e.g., on OSLR, OSNLR) or similar bodies (e.g., GEBCO, CCCO), as well as the Advisory Bodies (SCOR, ACMRR, ECOR), (so that) there was no further need for the SRB." 69

The Assembly accepted the Executive Council's recommendation, and formally abolished the Scientific Review Board. 70

The Secretary informed the Assembly that the revised Guidelines on the Structure and Responsibilities of the Subsidiary Bodies of the Commission had been drafted on the basis of the Executive Council's decisions and, together with all other essential corrections, including the new names (categories) of IOC subsidiary bodies, would be incorporated into a revised edition of the IOC Manual, after the present Assembly. 71

4.2 ADOPTION OF THE BIENNIAL REPORT FOR 1985-86

The Secretary introduced the Biennial Report of the Commission. He explained that reductions in the documentation to be presented to the 24th Session of the Unesco General Conference had resulted in an allocation of 10 standard pages for the IOC Report. As the text now before the Assembly was longer, further adjustments would be required. He also drew attention to the intention, if staff and financial resources so allowed, of producing a longer version, with illustrations, for the use of IOC Member States and public information purposes, as had been the practice in the past. He suggested that the Assembly give its approval to the text, with the required amendments, recognizing that further revision and editing was required which should be carried out in consultation with the Officers of the Commission. 72

Recalling the introduction to his Report on intersessional activities during 1986, and since many of the trends were similar for 1985-86 the biennium, he explained that he would not enter into a detailed account of the two-year period. He stressed the fact that, throughout the two-year period, a major goal had been to optimize the use of available resources with the means placed at the disposition of the Commission, despite the financial and staff constraints which had hampered certain aspects of programme implementation. The progress made in moving forward IOC activities had been greatly facilitated by the concerted action of Member States and the dedication of all concerned. 73

74 Numerous Delegates expressed their appreciation of the Biennial Report and the work of IOC reflected therein, recognizing that the IOC and its Secretariat were carrying out their responsibilities in a particularly difficult situation. Some Delegates pointed out the interests of their countries in various IOC programmes and trends which, in their opinion, should be reflected in the Biennial Report, so as adequately to inform the General Conference of Unesco.

75 There was general agreement that the present abridged version of the Report needed to be: (i) adjusted in terms of content and style for transmission to the Unesco General Conference, and (ii) expanded for wide distribution as a source of information on the IOC programme.

76 ▲ The Assembly requested the Director-General of Unesco to consider the possibility of allowing a small increase in the number of pages for the Biennial Report in view of the breadth and depth of the IOC programme and the diversity of activities that had taken place during 1985-86.

77 ◗ In considering how best to reflect the views of Member States in a revised version of the Report, the Assembly decided that suggestions for improvement, especially regarding the major thrusts to be brought to the attention of the Unesco General Conference, should be transmitted to the Secretariat in written form, preferably during the present Session, and in any case no later than 15 April.

78 ▲ The Assembly agreed that the Secretary should consult with the outgoing Chairman and First Vice-Chairman on the final version of the text.

79 ▲ Recalling the importance of public information in the work of IOC, the Assembly agreed that it was most important to assign the required manpower and financial resources so that a full biennial report could be issued for wide distribution.

5. OCEAN SCIENCES

5.1 OCEAN SCIENCE IN RELATION TO LIVING RESOURCES (OSLR)

80 The IOC Senior Assistant Secretary, Dr. Fernando Robles, introduced this subject. He reviewed major activities undertaken in the framework of the International Recruitment Programme (IREP) and its two main projects: the Sardine/Anchovy Recruitment Project (SARP) and the Tropical Demersal Recruitment Project (TRODERP).

81 He reminded the Assembly that the following components have been developed:

(i) Eastern Pacific: Three "SARP Within-Year Experiments" were proposed, addressing: the sardine population off northern Chile, the sardine population off central and northern Peru, and the anchovy population off the western USA and Mexico. Steps to develop these exercises included different training courses as well as approaches to a number of funding agencies to finance the proposals. No positive response has yet been received, as far as funding is concerned, although some limited resources may be made available for the southeastern Pacific exercises as part of the biological component of the IOC-CPPS El Niño proposal to UNDP now in the final stage of negotiation.

(ii) South-western Atlantic: Besides some training activities, regional experiments have not yet been designed, in the overall context of SARP. Some bilateral funding prospects are likely, especially in Brazil.

(iii) Iberian SARP: An OSLR/SARP Seminar on Potential Application of New Techniques in the Study of Recruitment in Pelagic Coastal Fisheries on the Iberian Shelf was held in Vigo, Spain, from 30 September to 4 October 1985. The Seminar was mainly funded under a USA-Spain bilateral programme. A proposal for funding, under the same scheme, of a three-year SARP exercise was approved in 1986. A SARP training course organized with the assistance of IOC and the Unesco Division of Marine Sciences was held in Vigo (24 November - 3 December 1986) and attended by specialists from Spain and Portugal.

(iv) IOCEA-I proposal: During the First Session of the IOC Regional Committee for the Central Eastern Atlantic (Doc. IOCEA-I/3), a proposal to initiate SARP experiments in the north-west African region was approved in the expectation that scientists of the following Member States of the region would participate: Morocco, Mauritania, Senegal and Spain.

(v) Sprat proposal: A Meeting on Sprat Recruitment Activities in the UK and FRG, held in Bremerhaven, 15 January 1987, recommended a British-German proposal on Co-operative Studies of the Processes Controlling Sprat Recruitment in Contrasting Environments, to combine on-going and planned sprat activities in the Irish Sea, German Bight and the Baltic.

Regarding the TRODERP initiative, an IOC-FAO Workshop on Recruitment in Tropical Coastal Demersal Communities was held in Ciudad del Carmen, Mexico, 21-25 April 1986 (Doc. IOC Workshop Report No. 44). Recommendations were made to initiate different regional and inter-regional comparative studies addressed to the IOC regional subsidiary bodies for IOCARIBE and WESTPAC. *82*

In addition to SARP and TRODERP, the possibility of developing an IREP project on squids was raised at the North Atlantic Fishery Organization's (NAFO) Special Session on Biology and Ecology of Squid (Halifax, Canada, September 1984). The question was also brought to the attention of the Cephalopod International Advisory Council (CIAC) at the CIAC Workshop on Early Growth Stages of Cephalopods (Banyuls-sur-Mer, France, 17 June - 1 July 1985). A CIAC IREP Sub-Committee has been formed to follow up this initiative. *83*

ICES has also pursued its various recruitment studies under the co-ordination of an IREP Steering Group which is represented on the Guiding Group of Experts on OSLR. Sessions dedicated to IREP have been organized during ICES Statutory Meetings, covering a wide range of relevant research problems. The Iberian SARP and the sprat initiative may also be considered in the ICES context. *84*

In view of the global interest in problems of phytoplankton blooms, red tides and associated mass mortality of marine organisms, *85* expressed through various recommendations of major IOC scientific and regional subsidiary bodies, such problems will be taken as a second major sub-programme under OSLR. Among activities already implemented through corresponding IOC Subsidiary Bodies, the study of fish kills in the IOCARIBE region should be recalled; the study was initiated by an hoc IOCARIBE Steering Committee for Developing Regional Contingencies for Fish Kills, which met in Mayagüez, Puerto Rico, 25-29 October 1982.

86 Several activities have been carried out in the framework of the WESTPAC Task Team on OSLR; an IOC Workshop on International Co-operation in the Study of Ocean Blooms and Red Tides is being organized in Takamatsu, Japan, 16-17 November 1987, to provide an overview of research in selected regions, identify research strategies and methods and suggest major research topics within the framework of OSLR and GIPME. The Workshop will follow an International Symposium on Red Tides - Biology, Environmental Science and Toxicology - organized by Japan and co-sponsored by IOC, SCOR and IABO, to be held in the same place, 10-14 November 1987.

87 Another on-going regional OSLR component deals with the organization, in the framework of IOCARIBE, of the Second Western Atlantic Turtle Symposium (WATS-II) to be held in Mayagüez, Puerto Rico, 12-16 October 1987, aimed at strengthening international co-operation in research and management of marine turtle populations in that region.

88 All the activities described will be reviewed during the Second Session of the IOC-FAO Group of Experts on OSLR to be held at FAO, Rome, 8-12 June 1987.

89 The Representative of ICES described activities developed through the ICES Steering Group on IREP. This Group has recommended concentration on process-oriented studies of mechanisms controlling recruitment variability. ICES is organizing a symposium on the early life history of marine organisms, to be held in Bergen, Norway, October 1988. ICES will continue to support the OSLR programme strongly, particularly IREP activities.

90 The Representative of IABO confirmed the support of his organization for IREP, mainly through the SCOR-Unesco-IABO Working Group 67 (Oceanography, Marine Ecology and Resources). This Working Group concentrates on studies related to fundamental theory and determination of recruitment; a seminar covering this theme will be held in Woods Hole, USA, October 1987. IABO also manifested its interest in the new major OSLR sub-programme on phytoplankton blooms and red tides.

91 Several Delegates expressed their satisfaction with the results obtained in the implementation of OSLR and commented on the work performed during the intersessional period by the Guiding Group of Experts. They emphasized that OSLR should be given a high priority amongst major programmes of the Commission, equivalent to that given to Ocean Processes and Climate Studies.

92 Many Delegates manifested their concern about the lack of funds to support IREP Projects already at the operational level, such as the South-eastern Pacific SARP component.

Various Delegates emphasized the need to strengthen theoretical studies aimed at elucidating the recruitment processes as well as the interface with appropriate aspects of economic theory. Experiments related to aquaculture studies may provide a good basis for such approaches. 93

The Delegates of Portugal and Spain confirmed the participation of their respective countries in the SARP Experiment conducted off their coasts, as well as their interest in the planned IREP squid and red tides sub-programmes of OSLR. 94

The Assembly approved the report on intersessional activities under OSLR presented on behalf of IOC and FAO. 95 ◗

The Assembly endorsed the development of the sub-programme on phytoplankton blooms, red tides and associated mass mortality of marine organisms, as a second major thrust of OSLR. 96 ◗

The Assembly reaffirmed the need for an OSLR component, under IOCINDIO, to be developed by the Guiding Group of Experts and corresponding IOC subsidiary bodies, with particular emphasis on SARP and TRODERP projects. 97

The Assembly requested the Secretary of IOC to continue to explore with multilateral and bilateral funding agencies the provision of resources to implement regional components, and urged Member States to support these actions. 98 ▲

The Assembly instructed the Secretary to examine the possibility of publishing a Newsletter or using similar media to diffuse information on OSLR activities, possibly with the assistance and support of a Member State or appropriate institution. 99 ▲

The Assembly expressed its appreciation to FAO for its strong support to the OSLR programme, and its satisfaction with the close and effective co-operation between the IOC and FAO in this programme in which governmental and academic scientists are interacting at the national and international levels, as recommended by the FAO World Conference on Fisheries Management and Development, and thus contributing to a better understanding of one of the major problems of effective prediction and management of living resources. 100

5.2 OCEAN SCIENCE IN RELATION TO NON-LIVING RESOURCES (OSNLR)

The Chairman of the IOC-UN(OETB) Guiding Group of Experts on Ocean Science in Relation to Non-Living Resources (OSNLR), Prof. Michel Vigneaux, introduced this subject. He informed the Assembly that, at its Second Session (Paris, 26-30 January 1987), the Guiding Group first considered the intersessional activities developed at the general and regional levels on the basis of priorities adopted identified at the First Session of the Guiding Group of Experts as well as relevant recommendations of the Thirteenth Session of the Assembly. The Group then examined a basic report on the production of fresh water from sea water, and another on the recovery of energy from the sea. It decided to consider fresh water in aquifers as one of the resources of the coastal zone. 101

102 The Guiding Group confirmed the priority it had given to the coastal zone at its First Session. Considering that one of the most important factors determining marine non-living resources is the variations in sea level due to climatic or tectonic processes, the Group decided to adjust the initial programme SETMY (Sea Level, Environments and Tectonics in the Past Million Years) to a more comprehensive programme on Sedimentary environments, Eustatic sea-level changes, Tectonics and Resources (SETR), within which links between resources and environments are considered without any time limitation. Special attention would be given to the Coastal Zone as a Resource by itself (CZAR) and to the effects of the sea-level changes, either natural or induced by human activities (e.g., subsidence due to the extraction of fresh water and hydrocarbons, and erosion due to the damming of rivers). In the Shelf and Upper Slope (SUS) regimes, the Guiding Group recommended the investigation and mapping of mean-sea-level changes during two key periods: the last glacial retreat (18 000 years before the present) and the last inter-glacial period (125 000 years before present).

103 Regarding the deep sea, the Chairman of the Guiding Group explained that research should be concentrated on: (i) tectonic and magmatic processes at convergent and divergent margins; (ii) distribution and composition of cobalt-rich ferromanganese crusts; (iii) hydrothermally produced sulphides; (iv) mapping of thick sediment sequences in marginal basins; and (iv) palaeogeographical studies.

104 The Representative of Unesco recalled that activities relevant to the coastal component of OSNLR are underway in eastern Latin America, under Unesco's COMAR Programme.

105 Several Delegates appreciated the Chairman's comprehensive information on regional activities and his detailed report on the Second Session of the Guiding Group, particularly its global approach to research programmes, and expressed their strong support for the Recommendations made by the Guiding Group.

106 Various Delegates re-stated the importance of research in the coastal zone as well as on mineral resources found in coastal areas, and especially such resources of interest to developing countries.

107 Many Delegates stressed the importance of strengthening regional projects so as to ensure a better implementation of the Programme.

108 The Delegate of Canada informed the Assembly that the International Centre for Ocean Development (ICOD) sponsored an International Training Course on Offshore Non-fuel Mineral Resources and Development and Planning, in Halifax (Canada), 1-15 March 1987, as a contribution to the OSNLR Programme.

109 The Delegate of China informed the Assembly that an international symposium on the coastal zone, with special reference to the coastal zone of China, will be held in his country, during the second half of 1988; he requested IOC co-sponsorship of this Symposium.

110 The Delegate of Japan pointed out that the OSNLR Programme should mainly focus on basic scientific research problems rather than on resource

assessment, particularly in the WESTPAC region, since STAR and SEATAR have on-going programmes on tectonics and resources.

The Assembly welcomed the specific programme proposals and the comprehensive report presented by the Chairman of the Guiding Group. 111

It accepted the Summary Report and endorsed the Recommendations of the Second Session of the IOC-UN(OETB) Guiding Group of Experts on OSNLR. 112 ◗

The Assembly recognized that human activities could result in negative effects on coastal zones, such as increased coastal erosion due to damming of rivers, and subsidence introduced by extraction of ground waters and hydrocarbons in coastal areas; negative effects can also derive from the exploitation of metalliferous muds. The Assembly stressed that these problems should be taken into account when developing the OSNLR Programme. 113

The Assembly strongly endorsed the establishment of regional Groups of Experts or Task Teams, as the case may be, as an appropriate mechanism for the development of OSNLR; it encouraged co-operation with other relevant programmes, notably the International Geological Correlation Programme (IGCP) and the Ocean Drilling Programme (ODP). It particularly welcomed the special effort being made to associate scientists from developing countries with deep-ocean research through arrangements for their participation in relevant drilling cruises. 114 ◗

The Assembly considered that TEMA support for the research components of OSNLR proposed by regional groups was essential for the successful implementation of the Programme at that level. 115

The Assembly instructed the Secretary of IOC to encourage development of regional projects as components of the Programme and urged the regional subsidiary bodies of the Commission to play an active role in their formulation and implementation. 116 ▲

The Assembly instructed the Secretary of IOC, in consultation with the UN(OETB), to: (i) promote and develop closer co-operation with the International Geological Correlation Programme (IGCP), particularly with its Projects 156 (Phosphorites) and 200 (Sea-level changes); (ii) develop contacts with the Ocean Drilling Programme (ODP) to seek possibilities for participation of scientists from developing Member States in ocean drilling cruises; (iii) explore sources of funding for these activities. 117 ▲

The Assembly invited the Director-General of Unesco to consider filling the post of marine geologist in the IOC Secretariat approved at the Twenty-third Session of the Unesco General Conference but presently in reserve, as soon as circumstances allow. 118 ▲

The Assembly urged the UN(OETB) to consider the secondment of a staff member specialized in marine geology to the IOC Secretariat, in the context of the ICSPRO Agreement, to assist in the implementation of OSNLR. 119 ▲

5.3 OCEAN MAPPING

120 The Chairman of the IOC Consultative Group on Ocean Mapping (CGOM), Mr. Desmond P.D. Scott, introduced the subject. He recalled that, in accordance with its Terms of Reference, the CGOM was required to report biennially to the Assembly on all Ocean Mapping activities of the Commission. He was therefore pleased to submit a full report (Doc. IOC/INF-702) which had been approved by the CGOM at its Second Session (Paris, 12-13 February 1987). The Chairman CGOM recommended study of the section headed "Achievements and Future Plans" in the document being presented. He then outlined the six main ocean-mapping activities of the Commission.

(i) The General Bathymetric Chart of the Oceans (GEBCO): The Joint IOC-IHO Guiding Committee for the GEBCO is now considering, inter alia, the preparation of a 6th edition of GEBCO which will be constructed from a data base formed by digitizing the bathymetric contours of the GEBCO (5th edition) sheets, and then updating these from newly acquired data. By agreement, the Bureau Gravimètrique International (BGI), Toulouse, France, has accepted responsibility for digitizing the GEBCO contours. Priority has been given to digitization of the Antarctic Sheets, to be followed by the Atlantic Sheets, in order to meet the requirements of the IUGS Circum-Atlantic Project (CAP), now in the early stages of planning. Some problems and delays have arisen and efforts are being made to find appropriate solutions.

121 The Chairman of CGOM informed the Assembly that sales of the GEBCO (5th Edition) sheets now exceed 50 000 copies.

122 The GEBCO Guiding Committee has recommended that the International Hydrographic Organization (IHO) establish a World Data Centre for Digital Bathymetry; this will be discussed further at the forthcoming International Hydrographic Conference in May 1987. It is envisaged that an IHO Member State will operate such a Centre on behalf of the IHO.

123 Work on an "International Gazetteer of Undersea Feature Names" has also progressed.

(ii) International Geological/Geophysical Atlases of the Atlantic and Pacific Oceans (GAPA): Preparation of both Atlases is now well advanced. The Atlantic Atlas is expected to be published in time for display at the Joint Oceanographic Assembly in Acapulco (Mexico) in 1988. The Pacific Atlas is running one to two years behind the Atlantic Atlas. A detailed Contents List of the two Atlases is attached as Annex IV to the CGOM Report.

(iii) International Bathymetric Chart of the Mediterranean and Overlay Sheets (IBCM): Following publication of the ten IBCM bathymetric sheets in 1981, the final sheet of the series - The Mediterranean and Black Sea in one sheet on a scale of 1:5 million will be published and be placed on sale in the second half of 1987. The IBCM bathymetric contours have been digitized for a group of oil companies by Petroconsultants (SA), Geneva.

124 The USSR has offered to publish at its own expense, as a contribution to the IOC, one series of geological and geophysical maps (ten sheets) a year. It is expected that colour-proof copies of Bouguer Gravity

Anomaly sheets will be ready by September 1987. Other series (Seismicity; Magnetic Anomalies; Plio-Quaternary/Messinian Structure; and Unconsolidated Sediments) are now in various stages of preparation.

(iv) International Bathymetric Chart of the Caribbean Sea and Part of the Pacific Ocean off Central America (IBCCA): The Editorial Board for the IBCCA held its First Session (EB-IBCCA-I) in Aguascalientes, Mexico, 29 September - 2 October 1986. The Board considered it desirable to incorporate the "Gulf of Mexico" into the title of the Chart and requested the Secretary IOC to take this action.

The Editorial Board agreed general criteria for the preparation of the IBCCA, and prepared an Assembly Diagram and "Specifications for the IBCCA". Responsibility for preparation of many of the sheets of the series was accepted by members of the Editorial Board. *125*

(v) International Bathymetric Chart of the Western Indian Ocean (IBCWIO): An Expert Mission to the region was carried out on behalf of IOC by Dr. Werner Bettac, Deutsches Hydographisches Institut, Hamburg, in July/August 1985, to ascertain interest in the proposed project. Arrangements for convening a Preparatory Meeting of Experts on the IBCWIO will be discussed at the forthcoming Second Session of the Regional Committee for the Co-operative Investigation of the North and Central Western Indian Ocean (IOCINCWIO).

In collaboration with the Federal Republic of Germany, a Regional Training Course on Bathymetric Charting in the Western Indian Ocean is being planned for July 1987 at a suitable institution in the region and aboard the R.V. METEOR. *126*

(vi) International Bathymetric Chart of the Central Eastern Atlantic (IBCEA): The IOC Programme Group on the Central Eastern Atlantic (IOCEA), at its First Session (Praia, Cape Verde, 19-23 January 1987), adopted a recommendation in which it requested the IOC Assembly to consider the need to establish an Editorial Board for IBCEA. France offered to take the lead in the preparation and publication of this particular Chart.

The Vice-Chairman of the IOC-UN(OETB) Guiding Group of Experts on OSNLR, Dr. Peter Cook, noted that bathymetric charts constitute the basic building blocks of any exploration for, and assessment of, marine non-living resources. However, in compiling such charts, it is important to ensure that there is no duplication. There is clearly a requirement to ensure co-ordination with the Committees for Co-ordination of Joint Prospecting in East Asian Offshore Areas (CCOP) and in South Pacific Offshore Areas (CCOP SOPAC), because of their involvement in mapping. The Guiding Group of Experts on OSNLR fully recognized the usefulness of GEBCO, which it sees as being an essential part of any non-living resource initiative, and it looks forward to co-operating with the IOC Consultative Group on Ocean Mapping (CGOM) in identifying future mapping priorities of relevance to OSNLR. *127*

The Representative of IHO reported that the draft article containing guidelines on collection, processing and storing of digital data, prepared by the GEBCO Sub-Committee on Digital Bathymetry for inclusion in the GEBCO Regulations, had been submitted by the IHB to the Volunteering Hydrographic Offices. All comments and suggestions received from the *128*

Volunteering Hydrographic Offices had been passed by the IHB to the Sub-Committee, which is now preparing a revised article for consideration by the GEBCO Guiding Committee at its forthcoming Session (28-30 April 1987), before final submission to IHO. He also stated that the IHO is exploring the feasibility of an agreement which would allow an IHO Member State to operate a World Data Centre for Digital Bathymetry on IHO's behalf, and that it is expected that the XIIIth International Hydrographic Conference (May 1987) will discuss this subject. The Representative of the IHO also assured the Assembly that the IHO is prepared to continue its joint work with IOC on its ocean mapping projects, as well as in other fields of mutual interest.

129 Several Delegations (Bangladesh, Brazil, Canada, Greece, Italy, Japan, Mauritius, Portugal, Turkey, USSR, USA, Venezuela) expressed their satisfaction with the work of the Consultative Group on Ocean Mapping, of the IOC-IHO Guiding Committee for GEBCO, of the Central Editorial Board for GAPA and of the IOC Editorial Boards for IBCM and IBCCA, and pledged support to the on-going and planned activities of the Commission in this field.

130 The Delegate of Canada acknowledged the very useful and considerable work done by the Joint IOC-IHO Guiding Committee for GEBCO. He indicated the necessity of developing a better mechanism for the world-wide sale and distribution of the maps, and supported the establishment of a World Data Centre for Digital Bathymetry.

131 The Delegate of Venezuela confirmed the willingness of Venezuela to participate in the IBCCA project and to host the Second Session of the Editorial Board.

132 The Delegate of Japan reported that preparation of an English/Japanese version of the publication "Standardization of Undersea Feature Names" had almost been completed by the Japan Maritime Safety Agency.

133 The Delegate of the USSR confirmed the willingness of his country to finalize the preparation and edition of the geological/geophysical overlay sheets of IBCM at a rate of one series (10 sheets) yearly, subject to submission of material in good time. He stressed, however, the need for yearly sessions of the Editorial Board.

134 The Chairman IBCM also stressed the importance of annual sessions.

135 The Delegate of Brazil expressed support for the establishment of a World Data Centre for Digital Bathymetry, but stressed that storage of digitized data on magnetic tape and maintenance of hand-drawn plotting sheets will have to live together for some years to come.

136 The Delegate of Turkey raised a formal objection to the Index for Areas of Responsibility in the Mediterranean Sea included as Annex V to the Summary Report of the Editorial Board for the IBCM (Doc. IOC/EB-IBCM-II/3) and asked that responsibility for plotting sheets in the Aegean Sea be left open pending settlement of the problems in this area.

137 The Delegate of the USA reported that her country intended to participate actively in the IBCCA by assuming responsibility for compilation

of five sheets of the series of twenty-one sheets adopted by the Editorial Board, and, within the constraints of available resources, by providing guidance to compilers regarding the location and availability of pertinent bathymetric data in the USA and elsewhere, for other sheets, and to make available data held in the USA. She also informed the Assembly that her country has offered to host a workshop on data sources and map compilation for the IBCCA Project, at the National Geophysical Data Centre, Boulder, Colorado, later this year or early next year. Although the Workshop agenda will be largely focussed on the IBCCA region, participation by those involved in other IOC mapping projects would be welcome.

The Delegate of Greece informed the Assembly that his country actively participates in the IBCM project, particularly in the up-dating of the plotting sheets and in the preparation of the IBCM overlay sheet on unconsolidated sediments. Regarding the areas of responsibility for maintaining the 1:250 000 bathymetric plotting sheets, the Delegate of Greece informed the Assembly that the decision regarding their delimitation in the Aegean Sea had already been taken (as reported in Document IOC/EB-IBCM-II/3) and that Greece has recently submitted to the International Hydrographic Bureau (IHB) new bathymetric data for its area of responsibility. Moreover, the responsibilities concerning these zones had been defined since 1978. He was therefore surprised to see in Document IOC/INF-702 reference to an outstanding problem on the responsibility for the sheets covering the Aegean Sea. 138

The Delegate of Mauritius expressed gratitude to the Federal Republic of Germany for its offer of assistance in the preparation of an IOC International Bathymetric Chart of the Western Indian Ocean (IBCWIO). He noted that a bathymetric survey of areas adjacent to Mauritius in collaboration with France through the office of Territoires des Terres Australes et Antarctiques Francaises (TAAF) was planned for later this year. 139

The Assembly accepted the Summary Report of the Second Session of the Consultative Group on Ocean Mapping. 140 D

The Assembly strongly encouraged marine scientists and other persons in the Member States wishing to name undersea features, to check their proposals with published Gazetteers of Undersea Feature Names, taking into account the guidelines contained in the IHO-IOC publication 'Standardization of Undersea Feature Names' (including the use of the Undersea Feature Name Proposal Form contained therein), to submit all proposed new names for clearance, either to their appropriate national authority or, where no such national authority exists, to the IOC or IHB, for consideration by the GEBCO Sub-Committee on Geographical Names and Nomenclature of Ocean Bottom Features, which may advise on any potentially confusing duplication of names. ▲ It also called on Member States to invite publishers of ocean maps, and editors of scientific journals, in their country, to require compilers and authors to provide written evidence of such clearance before accepting for publication any maps or scientific articles containing new names for undersea features. 141 ▲

The Assembly expressed its sincere appreciation to the Government of the USSR for its support to the IOC activities in ocean mapping by its secondment of an expert to the IOC Secretariat and by funding the preparation of the GAPA Atlases and the IBCM Overlay Sheets. 142

143 The Assembly welcomed the offer of the USSR to publish geological/geophysical overlay sheets for the IBCM.

144 The Assembly accepted the Summary Report of the First Session of the Editorial Board for the International Bathymetric Chart of the Caribbean Sea and Part of the Pacific Ocean off Central America and concurred with the proposal to include the term Gulf of Mexico in the title of IBCCA; it called on the Editorial Board for IBCCA to do so in due course.

145 The Assembly acknowledged, with thanks, the offers of Venezuela and the USA to host the Second Session of the Editorial Board for IBCCA and a Workshop on IBCCA, respectively.

146 It thanked the Government of France for its generous offer to assist in the preparation and publication of the IBCEA.

147 The Assembly adopted Resolution XIV-1.

5.4 OCEAN DYNAMICS AND CLIMATE

148 The Chairman of the Joint SCOR-IOC Committee on Climatic Changes and the Ocean (CCCO), Dr. Robert Stewart, introduced this subject. He highlighted the key accomplishments and identified issues affecting implementation of the programme. First, there are significant accomplishments within TOGA, particularly regarding sea-level and thermal monitoring, which now allow modellers to attempt predictions of, for example, the 1986 El Niño. While the Chairman CCCO was not confident that all events would be detected or even that false alarms would not be issued, he was encouraged. The accomplishments are not uniform, however, since major gaps exist in the Indian Ocean coverage. TOGA data centres, analysis centres and the International TOGA Project Office have been set up. The WMO-IOC Intergovernmental TOGA Board will provide a forum for intergovernmental consultations to facilitate co-ordination of inputs.

149 Plans for WOCE continue to be developed and refined. The WOCE Implementation Plan will be completed in 1987 and submitted to an international conference in 1988. The WOCE International Planning Office is being augmented and several Member States have organized or are organizing national WOCE planning committees and offices.

150 The First Implementation Plan for the World Climate Research Programme (WCRP) was issued in November 1985. That document, which incorporates the WOCE and TOGA plans, was issued as a basis for the WMO-IOC Informal Planning Meeting (Geneva, May 1986) at which requirements, commitments and gaps were assessed. Sufficient commitments of resources appear to have been made or are being seriously considered by Member States to allow the programme to proceed along the lines described in the Implementation Plan.

151 The key implementation issues that require continued attention are as follows:

(i) Although progress has been made in the development, under IGOSS, of a global XBT network, this network of reporting ships is still a thin one; the existing ship-of-opportunity tracks in the Pacific and in the Atlantic, augmented by the SECTIONS Programme cruises, come close to meeting the requirements, but the Indian Ocean is still data-sparse.

(ii) The sea-level measuring network still has significant gaps in the Indian and Atlantic Oceans and at high latitudes.

(iii) Until recently, the availability of remotely sensed data from oceanographic satellites for climate research seemed assured. However, the NROSS programme, which was to place a scatterometer in orbit simultaneously with the TOPEX/POSEIDON altimetry mission, has been cancelled; alternatives are being sought, however. The possibility of malfunctions can be accepted, but cancellation for non-technical reasons is more difficult to accept and shows that the IOC must constantly persuade governments of the programme requirements. At the same time, special attention must be given to obtaining sea-truth data: mainly highly accurate sea-level and sea-surface temperature data.

Funding is a continuing problem, but not the only one; greater progress could be made if a spirit of co-operation could be disseminated through the organizational hierarchies of Member States. Investigators are still stymied in their attempts to obtain data that are known to exist and, for one reason or another, kept from the archives and exchange systems. Scientists planning equipment installation or research cruises continue to run into difficulty in obtaining permission to operate in waters under national jurisdiction, to obtain visas, or to receive or trans-ship equipment and supplies. One step toward solving the problem is the identification of an IOC-WMO TOGA contact in each Member State for TOGA matters. The Commission may wish to encourage its Member States to adopt internal measures so that the person designated as the TOGA contact would be in a position to assist effectively in solving relevant problems at the national level. Unless resolved, these problems will be multiplied many times over when WOCE moves from the conceptual phase to the operational phase, since WOCE will involve more ships and more nations than those in TOGA, and will require a higher degree of co-ordination of major resources. *152*

The ability of Member States to participate in, and derive benefits from, the WCRP is linked directly to their ability to develop a cadre of scientists specially trained in ocean/climate research. Even in the developed nations, the number of scientists with interest in climate modelling needs to be increased substantially. A preliminary inquiry by the Joint SCOR-IOC CCCO identified ten immediate offers of advanced training, some at the graduate level, for scientists from developing countries. Eight were for extended on-the-job training at research institutions. Given the necessary funding support, a research-training and research-fellowship programme in ocean/climate research is feasible. *153*

The President of SCOR, Dr. Gerold Siedler, informed the Assembly that the XVIIIth General Meeting of SCOR recently reviewed the activities of CCCO. It concluded that this Joint Committee of IOC and SCOR has done excellent work in the planning of the oceanographic aspects of the WCRP, particularly with respect to TOGA and WOCE. The existing mechanisms have proved to be effective in involving highly qualified scientists in the *154* planning of these programmes as well as in promoting their assistance in the development of proposals relating to the requirements for intergovernmental action. He referred particularly to intergovernmental efforts within GLOSS, IGOSS and IODE. He informed the Assembly that the view of SCOR is that the arrangements for CCCO activities need not be changed or supplemented at the present time, although it may be necessary to reconsider this topic at the time of the International WOCE Scientific Conference in 1988.

155 The President of SCOR also drew attention to the need to ensure that research vessels involved in these international programmes will be able to operate not only in the open ocean, but in coastal areas as well. Access to maritime zones under national jurisdiction will be needed for observational purposes, while access to ports is necessary for the exchange of ship personnel and equipment. SCOR looks to IOC as the most appropriate intergovernmental organization to consider this particular question and to assume the responsibility for ensuring the necessary international co-operation.

156 The Chairman of the Technical Committee on Ocean Processes and Climate (OPC), Dr. Klaus Voigt, reported on the outcome of the Committee's Second Session (Paris, 10-13 March 1987). The Executive Summary, including the Recommendations and the sole Resolution of the Session, was submitted to the Assembly. The Technical Committee considered the progress in the development of the Global Sea-Level Observing System (GLOSS), the IGOSS Ship-of-Opportunity Programme, the Joint IOC-WMO Drifting-Buoy Programme and opportunities offered by new ocean technologies, and made recommendations on the further development of these projects. The Technical Committee considered the joint efforts of the Technical Committee for IODE and the SCOR-IOC CCCO in oceanographic data management in support of TOGA and WOCE, and strongly supported the relevant recommendations of the Twelfth Session of IODE. The Technical Committee for OPC emphasized the need to intensify efforts by the Commission and the Unesco Division of Marine Sciences to assist developing countries to enable them to participate actively in the WCRP, TOGA and WOCE in particular. The Technical Committee for OPC noted the rapid development of various new technologies for ocean observation; it recommended that relevant IOC subsidiary and advisory bodies consider the problems of intercalibration, standardization and data formats for new technological advances, and the establishment of a solid basis for an adequate ocean-observing system with a view to setting up an effective ocean-monitoring system. In response to the request of the Executive Council at its Nineteenth Session, the Technical Committee reviewed the present international mechanisms for scientific planning and intergovernmental co-ordination of oceanographic activities within the WCRP. The Technical Committee considered that the present arrangements for co-ordination of the TOGA Programme (the Intergovernmental TOGA Board, the Scientific Steering Group for TOGA, the International TOGA Project Office, and TOGA National Contacts) are quite satisfactory and provide mechanisms for effective collaboration with IOC and WMO.

157 The Technical Committee generally agreed that the present arrangements for the WOCE International Planning Office are satisfactory, and decided that, in consultation with the SCOR-IOC CCCO and the sponsoring countries, it would keep under review the operations of the International TOGA Project Office and WOCE International Planning Office and bring to the attention of the IOC any problems or issues that may arise regarding these

operations that require action by the IOC. The Technical Committee also agreed that it is premature to consider a formal intergovernmental mechanism for co-ordination of WOCE.

The Technical Committee decided that it could continue to serve as the focus for IOC's activities in the promotion of the development and co-ordination of global ocean observing systems related to the WCRP and co-ordination of various national, multinational and regional programmes related to the WCRP, in close co-operation with the SCOR-IOC CCCO. *158*

The Representative of WMO expressed his Organization's appreciation to Member States of IOC for their support for the WCRP and for TOGA in particular. He emphasized the importance of close collaboration of the oceanographic and meteorological communities, WMO and IOC, and indicated some additional or expanding areas of co-operation, including training of specialists in the field of marine meteorology and oceanography; the problem of calibration and standardization of observations; joint activities under IGOSS, drifting-buoy programmes and data management within WCRP. He specifically indicated that co-operation of IOC would be sought regarding the development and implementation of the WMO Training Course (6-month) on Marine Meteorology and Physical Oceanography, which, it is hoped, may be eventually organized at the WMO Regional Meteorological Training Centre in Nairobi. *159*

The Secretary of IOC noted with satisfaction the progress in improving international co-ordination of TOGA and the good co-operation of IOC with WMO and SCOR. He wished, however, to point out that this partnership could be further improved by clarifying and formalizing the relationship and the liaison between IOC and the WOCE International Planning Office. This would facilitate possible future secondment by IOC of a specialist to work in that Office. He noted that more effective use of IOC regional subsidiary bodies would facilitate implementation of relevant recommendations of the SCOR-IOC CCCO. *160*

Many Delegates (Argentina, Australia, Brazil, Canada, China, Chile, France, Germany Federal Republic of, India, Japan, Mexico, Pakistan, Peru, Poland, USSR, UK and USA) briefly described their participation in, or support for, oceanographic activities within or relevant to the WCRP. Reports on national activities related to WCRP were presented at the Second Session of the Technical Committee on Ocean Processes and Climate and they will be distributed to Member States in the form of an IOC Information document. *161*

The Delegates of Canada, France, Poland, the Federal Republic of Germany and the USA emphasized the need to strengthen the role of IOC in facilitating access to marine areas under national jurisdiction by research vessels participating in, or contributing to the WCRP, as well as in transfrontier shipment of equipment and in making data from those zones available. *162*

Some other Delegates (Argentina, Brazil, Greece and Mexico) expressed their disagreement with the previous view, stressing that it was not within the competence of IOC to facilitate access to marine areas under national jurisdiction by research vessels. They stressed that these *163* activities should remain subject to the regime for marine scientific research in zones under national jurisdiction.

164 A large number of Delegates supported the conclusions of the Technical Committee for Ocean Processes and Climate that the present arrangements for international scientific planning and intergovernmental co-ordination for TOGA are satisfactory and provide a good basis for co-ordination between IOC, SCOR and WMO.

165 The Delegate of the People's Republic of China informed the Assembly that his country was participating actively in TOGA, by organizing research cruises in the Pacific and joint expeditions with Japan in the Kuroshio area. China is willing to offer shipboard fellowships for scientists from developing countries and to host a CCCO Pacific Ocean Climate Studies Panel Meeting in 1988 or 1989. In his view, it will be necessary to strengthen the intergovernmental co-ordination of the oceanographic component of the WCRP.

166 The Delegate of France informed the Assembly of the planned joint French-US satellite mission POSEIDON/TOPEX, the establishment of the TOGA Sub-surface Data Centre, in Brest, and France's readiness to take responsibility for a WOCE South Atlantic Centre, should one be recommended.

167 The Delegate of Mauritius stated that his country is prepared to take an active part in the TOGA Programme and in improving ocean-observing systems in the Indian Ocean in support of WCRP. He expressed hope that the CCCO Indian Ocean Climate Studies Panel Meeting, which will be held in his country in April 1987, will make specific proposals on the development of an observational network in the Indian Ocean.

168 The Delegate of the USA informed the Assembly that his country gives very high priority to WCRP, and particularly to TOGA and WOCE, and urged IOC to give priority to, and focus on, operational support (GLOSS, IGOSS, IODE) and to assist developing countries to participate effectively in the oceanographic activities of the WCRP.

169 The Delegate of Indonesia noted the importance within the TOGA and WOCE programmes of the study of water-mass exchange between the Pacific and Indian Oceans through the Indonesian seas. He stated that his country wishes to participate in the WCRP and recalled that USA and Australia were assisting Indonesia in the installation of sea-level stations.

170 The Delegate of the USSR informed the Assembly of the implementation of the multinational programme "Energetically Active Zones of the Ocean - SECTIONS" being implemented since 1981 by joint efforts of Bulgaria, Cuba, German Democratic Republic, Poland and the USSR. An international co-ordinating meeting was held in the German Democratic Republic in October 1986 with the participation of a Representative of IOC.

171 The Delegate of the Federal Republic of Germany informed the Assembly of the activities of his country in support of TOGA and WOCE. He noted that the Federal Republic would collect meteorological data from the South Atlantic and provide it to the TOGA Marine Climate Centre in the UK. His country is making a substantial effort in ocean-climate modelling. It

strongly supports GLOSS and is studying water exchange between the Indian and Pacific Oceans.

The Delegate of Japan informed the Assembly that the national programme for WCRP had been adopted in 1986 for the period 1987-1990. Japan is studying cloud distributions, interannual variations in Antarctic sea ice, mixed-layer dynamics (Ocean Mixed Layer Experiment (OMLET)). A new ocean satellite, MOS-I, was launched in February 1987. 172

The Delegate of the UK recalled that his country supports the WOCE International Planning Office, located in the Institute of Ocean Sciences (IOS), Wormley. The Director of the Office, Dr. G. Needler, was seconded by Canada, and the Federal Republic of Germany has recently seconded Dr. P. Koltermann to the Office. He invited IOC to consider seconding a specialist to the Office. 173

The Delegate of Canada reported on national climate programme activities, particularly on the development of coupled ocean-atmosphere models and regional studies aimed at understanding linkage between global and regional processes. 174

The Assembly noted the Executive Summary of the Second Session of the Technical Committee for Ocean Processes and Climate containing the major conclusions and Recommendations on the international mechanism for scientific planning and intergovernmental co-ordination of TOGA and WOCE. It also noted that Prof. Dr. sc. K. Voigt (German Democratic Republic) was unanimously re-elected Chairman of the Technical Committee, and Mr. S. Ragoonaden (Mauritius) was unanimously elected Vice-Chairman. 175

The Assembly endorsed the establishment of the Joint WMO-IOC Intergovernmental TOGA Board. 176 ◗

The Assembly agreed that it is premature to consider a formal intergovernmental mechanism for co-ordination of WOCE and that this matter could be discussed at the time of the International WOCE Scientific Conference in 1988. It decided to host the International WOCE Scientific Conference in 1988 in co-sponsorship with WMO, ICSU and SCOR. 177 ◗

The Assembly recognized that particular efforts to develop ocean observing systems in support of TOGA and WOCE will be required in the Indian Ocean, and called on the Technical Committee for Ocean Processes and Climate, the Joint IOC-WMO Working Committee for IGOSS and the WMO-IOC Drifting Buoy Co-operation Panel (DBCP) to concentrate their efforts on the implementation of ocean-observing systems (sea level, XBTs, drifting buoys), with a particular view to supporting TOGA and WOCE. 178 ▲

The Assembly noted with satisfaction the action taken by the Technical Committee on IODE (at its Twelfth Session), in co-operation with the SCOR-IOC CCCO regarding oceanographic data management in support of TOGA and WOCE, and welcomed the establishment of TOGA Oceanographic Centres in the USA and France. The Assembly stressed the need for more active participation of NODCs in activities of the WCRP, through the RNODC scheme. This matter is further discussed under Agenda Item 6.2.2 below. 179 ▲

180 The Assembly emphasized that the integrated and comprehensive nature of the WCRP calls for the co-ordination of activities of most of the IOC subsidiary bodies and close collaboration with WMO.

181 The Assembly decided to intensify efforts to assist developing countries so that they could not only participate actively in observational components of the WCRP, but also increase the ability of their scientists to contribute to scientific investigations and to applications of the results to national socio-economic development. It called on the Unesco Division of Marine Sciences to join in this effort. It requested the Joint SCOR-IOC Committee on Climatic Changes and the Ocean to prepare a report on new ocean-observing techniques with a view to assisting or enhancing the participation of developing countries in the WCRP.

182 The Assembly recommended that the joint efforts of IOC and FAO in the improved use of research vessels, including the maintenance of research-vessel directories, provision of manuals and organization of management courses, be taken into account when implementing WOCE.

183 The Assembly decided that the Technical Committee for Ocean Processes and Climate, in particular, should keep under review the implementation of various programmes and ocean-observing systems relevant to WCRP.

184 The Assembly adopted Resolution XIV-2.

5.5. MARINE POLLUTION RESEARCH AND MONITORING

5.5.1 Implementation of the Action Plan for the Global Investigation of Pollution in the Marine Environment (GIPME)
5.5.2 Development of the Marine Pollution Monitoring System (MARPOLMON)
5.5.3 Effects of Pollutants on Marine Ecosystems

185 The Chairman of the IOC Scientific Committee for the Global Investigation of Pollution in the Marine Environment (GIPME), Dr Neil Andersen, introduced these subjects. He referred particularly to the Secretary's Report (Document IOC-XIV/6), the Report of the Sixth Session of the Scientific Committee for GIPME (Document IOC/WC-GIPME-VI/3) and the Action Plan for GIPME (Document IOC-XIV/8 Annex 7), as well as papers on the programme that had been published in scientific journals during 1986. The Chairman informed the Assembly of the state of the GIPME Programme. He noted the considerable progress in the work of GEMSI in the development of methods and their application, as well as training in them, and studies of river inputs. In the work of the Group of Experts on Effects of Pollutants (GEEP), he particularly recalled the successful Workshop on Biological Effects Measurements, and the studies of the vulnerability of marine areas to pollution. An important step forward has also been taken by the establishment of the new Group of Experts on Standards and Reference Materials (GESREM). In regional programmes, particularly in the Caribbean, the south-east Pacific, the western Pacific (WESTPAC), and in the central eastern Atlantic (IOCEA), regional components of GIPME continue to be developed. Co-operation with other Organizations, particularly UNEP, FAO, IMO, and IAEA, as well as ICES and CPPS, developed encouragingly. The Scientific Committee also emphasized the need for the GIPME Programme to

increase its association and interfacing with basic international marine research programmes of a global nature; the Chairman of the Scientific Committee noted that, since the Sixth Session, association with the emerging international Joint Global Ocean Flux Study had been established through the participation of an IOC staff member and an Officer of the Scientific Committee for GIPME in the expert meeting on that subject, held at ICSU (Paris, 17-19 February 1987). The meeting was organized partly on the initiative of the Chairman of the Scientific Committee.

The Scientific Committee, at its Sixth Session, also reviewed and established priorities in the Programme and placed these in the framework of an Action Plan (Document IOC-XIV/8 Annex 7). The Scientific Committee also recommended increased co-operation with UNEP in the field of pollutant effects. He noted that, since the Scientific Committee's Sixth Session, UNEP had decided to co-sponsor GEEP and GESREM. Slightly amended Terms of Reference for these two Groups of Experts are therefore before the Assembly for consideration and eventual endorsement. Producer agencies (of standards and reference materials), at the First Session of GESREM (Paris, 9-12 February 1987), showed great interest and identified needs for further production of reference materials required within the IOC and UNEP programmes. The Group of Experts identified potential producers of these materials and suggested a possible distribution mechanism. The Chairman of the Scientific Committee emphasized that a scientific plan for the open-ocean baseline study for trace metals has been endorsed by GEMSI and that a logistic plan is under development, on the basis of tentative offers of ship time, the possible use of research vessels on passage between operational cruises, and national programmes running sections from the shelf to the open ocean. Member States were urged to commit ship time for this important exercise. *186*

The Representative of ICES stated that the ICES Council, at its Statutory Meeting in 1986, had considered favourably the GIPME Programme and responded positively to invitations from IOC to interact strongly, and had designated members to GEEP and GESREM so as to secure adequate interaction between the relevant ICES and IOC expert groups. *187*

In response to concern expressed by some Delegates that the financial implications of the Action Plan were not identified, the Chairman explained that the Scientific Committee had considered the implications. He also stressed the need to define the requirements for implementation in view of the interaction with other Organizations and the soliciting of external support. *188*

Several Delegates emphasized the need for on-going development of reference methods and standards and reference materials, as well as for the supply of such materials. Some stressed the need for the introduction of new techniques and the consideration of new substances and priorities, as well as the inclusion of modelling in marine pollution research and monitoring studies. *189*

Several Delegates stressed the importance of including biological-effects studies in monitoring programmes and welcomed the contribution of GEEP in this context. Some Delegates expressed the view that the global musselwatch programme should not proceed without due consideration of experience in similar activities. *190*

191 The Chairman of the Scientific Committee informed the Assembly that due account was taken of this experience, including that of the relevant ICES and US exercises.

192 A few Delegates stressed the need to obtain open-ocean baseline data and implement, as a matter of priority, the open-ocean baseline study, and other Delegates stressed that data obtained in the MARPOLMON system and the national programmes should be reported to National Oceanographic Data Centres and to the RNODCs for MARPOLMON, WESTPAC (Japan), the North Atlantic (USSR), and Caribbean (USA).

193 Some Delegates expressed satisfaction with the strong TEMA component of the GIPME Programme and stressed the need for a continued TEMA effort.

194 The Delegate of Bulgaria offered ten-month fellowships at the University of Sofia in the field of marine pollution research and monitoring. He also reported that, from 1 to 3 October 1987, there will be a scientific and technical conference on the chemical resources of the Black Sea and the protection of the marine environment against pollution; this conference will be held at the Sunny Beach Resort, Bulgaria, with some support from Unesco.

195 Many Delegates stressed the global aspects of GIPME and considered that the Programme provided a global mechanism for co-ordination and implementation which should be utilized. It was emphasized that IOC should take the lead in marine pollution research and monitoring studies in the UN system, in co-operation with other Specialized Agencies and UNEP. The trend in this direction was noted with satisfaction, and several Delegates endorsed further efforts to increase co-operation.

196 Some Delegates emphasized the appropriateness of the association of the GIPME Programme with basic international scientific programmes of a global nature, for mutual benefit.

197 The need for implementation on a regional basis and particularly the need to continue support of well established regional programmes such as the one in the Caribbean, was emphasized by many Delegates.

198 The Assembly noted with satisfaction the steady development of the GIPME Programme and its MARPOLMON, both globally and regionally. It thanked the Chairman of the Working Committee, Dr Neil Andersen, and the Vice-Chairman, Dr. Roger Chesselet, for their efforts in this regard.

199 The Assembly endorsed the Report and Recommendations of the Sixth Session of the Working Committee for GIPME and the Action Plan.

200 The Assembly reaffirmed its view that GIPME provides a framework for effective and productive co-operation and urged Member States to contribute adequate scientific and other resources to an effort to increase the achievement of the objectives of GIPME and the further implementation of MARPOLMON and its regional components.

The Assembly recognized that many emerging international biogeochemical and physical oceanography programmes are directly relevant to GIPME and urged scientists and Member States involved in the planning and implementation of these programmes to remain mindful of the requirements of GIPME and of its potentialities for assisting the relevant components of such programmes. 201

The Assembly welcomed the development of co-operation with other UN activities, and noted with appreciation the co-sponsorship, by IAEA and UNEP of the GIPME Group of Experts on Standards and Reference Materials, and by IMO and UNEP, of the Group of Experts on the Effects of Pollutants. 202

The Assembly instructed the Secretary to pursue efforts to: (i) implement the open-ocean baseline study, (ii) enhance co-operation with other bodies, within the UN system or outside it (e.g., SCOR and ICES), and (iii) advance the accomplishment of the GIPME Programme in accordance with the Action Plan and the guidance of the Scientific Committee. 203

The Assembly adopted Resolutions XIV-3, XIV-4 and XIV-5. 204

5.5.4 Global Ocean Flux Study

The Chairman of the Scientific Committee for GIPME, Dr. Neil Andersen, introduced this subject. He referred particularly to Documents IOC-XIV/8 Annex 8 (IOC and the ICSU International Geosphere-Biosphere Programme: A Study of Global Change) and IOC-XIV/8 Annex 8 Addendum, and Document IOC/INF-699 (Report of the IOC Advisory Bodies to the Fourteenth Session of the IOC Assembly). He informed the Assembly that, in the USA and other countries, a Global Ocean Flux Study has been initiated. It is a study concerned with the biogeochemical production, transport, transformation and fate of biologically important material through the marine environment, with an emphasis on carbon, taking into consideration processes in the open ocean and continental boundaries. The Scientific Committee considered it necessary to address the question of whether or not a flux programme should provide for the co-operation and collaboration of scientists in this area of research and serve as a component of the ICSU International Geosphere-Biosphere Programme (IGBP). Accordingly, the National Science Foundation and the USA GOFS Planning Office, at the Woods Hole Oceanographic Institution, with the Secretary of the Joint SCOR-IOC Committee on Climatic Changes and the Ocean (CCCO) and the Chairman of the Scientific Committee for GIPME, requested SCOR to convene a meeting of concerned scientists to consider this matter. 205

The President of SCOR, Dr. Gerold Siedler, informed the Assembly that SCOR had decided at its Eighteenth General Meeting to convene an International Scientific Planning and Co-ordination Meeting on a Global Ocean Flux Study, to bring together scientists from the groups active in the study of the major biogeochemical cycles, representatives of relevant SCOR Working Groups, CCCO and the IOC Scientific Committee for GIPME. This SCOR Meeting was held on 17-19 February 1987 at ICSU Headquarters in Paris. The Meeting concluded that an international body is required to identify detailed research objectives, to develop a scientific plan and to recommend the necessary international programme. The participants felt strongly that a Scientific Planning Committee should be established for this purpose under 206 the auspices of SCOR, and the name of the programme should be Joint Global Ocean Flux Study (JGOFS). This proposal will be considered by the SCOR Executive Committee in October 1987. The Meeting also considered the relation of JGOFS to the ICSU International Geosphere-Biosphere Programme, to the ICSU-WMO World Climate Research Programme and to the IOC Scientific Committee for the Global Investigation of Pollution in the Marine Environment. It was recommended that informal communication be established with the new ICSU Special Committee for the Geosphere-Biosphere (SCGB) and that the possibility of more formal links be considered at a later date as the IGBP develops its priorities. Communication with CCCO should be carried out through SCOR, and GIPME should be invited to provide a technical expert. To preserve the momentum and enthusiasm of the scientific groups involved, it was also proposed to convene in the near future a workshop on the state of planning of flux studies in the North Atlantic. An invitation was received from Dr. Duplessy (France) to host this workshop in Paris from 7 to 11 September 1987.

207 The President of SCOR explained that SCOR would like to use this opportunity to enlarge the number of active research groups by facilitating the participation of scientists from countries that had not been involved in the earlier planning. He noted that the type of work required in the near future could well be carried out within the SCOR structure. When the need for intergovernmental action arises with respect to this programme, SCOR, in consultation with ICSU, will certainly present such considerations and resulting proposals to the IOC.

208 The Secretary IOC pointed out that programmes such as IGBP and JGOFS would put large demands on manpower and financial resources and that every effort should be made to avoid hampering the implementation of on-going programmes by the diversion of resources to new global activities. It was also clear, he noted, that several bodies have more or less simultaneously identified the overall problem areas associated with global fluxes. He also noted the possibility that the formal involvement of CCCO would be required at some point in the scientific planning of JGOFS and that this should be considered at joint consultations of representatives of SCOR and IOC, since CCCO is a joint body of IOC and SCOR. The planning and preparation for intergovernmental involvement in a programme should be carried out in parallel with the scientific planning so that governments would be prepared to participate when the scientific planning phase is completed. Experience shows that it is not appropriate to involve governments only after the planning is completed. He believed that it is highly desirable that the IOC, through the GIPME Programme, maintain close contact with the Joint Global Ocean Flux Study and that the possible role of IOC in the implementation of the programme, jointly with ICSU, and as a component of the IGBP, be considered in consultation with SCOR as an advisory body of the Commission.

209 Several Delegates informed the Assembly of relevant national initiatives in the field of flux studies and considered such investigations to be very important. Some Delegates considered it appropriate that the further development of the Joint Global Ocean Flux Study be undertaken by SCOR which should report to the IOC on its progress at an appropriate time, for consideration and decision by the Commission as to the most appropriate course of action.

Some Delegates emphasized that the information received was new and needed to be considered carefully before definite actions could be decided. A few Delegates also requested the Secretary to make available to the Member States concerned, translated versions of such major international proposals as IGBP and JGOFS in the other official languages of the Commission, to facilitate consideration of the Commission's eventual involvement. 210

Many Delegates also attached great significance to the ICSU IGBP initiative and considered that IOC should carefully evaluate its potential involvement or association with oceanographic components of IGBP at an early stage. 211

The Assembly acknowledged the importance and significance of JGOFS. It decided that IOC should follow the development of JGOFS closely, so that the Commission will be adequately prepared to discuss with ICSU and SCOR at the appropriate time its future role in JGOFS. 212

The Assembly also decided that IOC should co-operate as appropriate with IGBP projects in due course. 213

The Assembly decided to convene an *ad hoc* expert meeting to consider this matter intersessionally and to report to the Assembly at its Fifteenth Session. 214

The Assembly adopted Resolutions XIV-6 and XIV-7. 215

The Delegate of the United Kingdom said that, in his opinion, the action called for in Resolution XIV-6 could well be premature. He agreed that it was important for the Commission to consider the extent of its involvement in the IGBP in good time, before the start of the programme, but the need to report to IOC-XV should not be taken as a reason for calling the *ad hoc* meeting too early and before the scientific plan and other supporting material had been provided by SCOR. 216

The Delegate of Canada expressed the willingness of his government to host the *ad hoc* meeting, in Ottawa, at a time consistent with the development of the scientific plan for the IGBP. 217

6. OCEAN SERVICES

6.1 THE INTEGRATED GLOBAL OCEAN SERVICES SYSTEM (IGOSS)

The Chairman of the Joint IOC-WMO Working Committee for IGOSS, Dr. Yves Tourre, introduced this subject. He briefly reviewed the state of development of the System, highlighting present trends in accelerating the implementation of IGOSS, pursuant to Resolution XIII-6 and to the WMO Executive Council Resolution 11 (EC-XXXVII). 218

A special effort has been made to implement new ship-of-opportunity lines to effect BATHY (temperature versus depth) measurements and to transmit the data in "real time". To that end, measuring devices and transmission systems are being increasingly automated. At the same time, 219 attempts are being made to increase the contribution from research, fishery and naval vessels, but success in this respect is still uneven; however, new reports are being received from the tropical Atlantic and Indian Oceans. The trend is encouraging, even if IGOSS is not yet fully meeting existing requirements, in particular those of the World Climate Research Programme.

220 New products are becoming available in a timely fashion, thanks to oceanographic or meteorological centres that have agreed to act as IGOSS Specialized Oceanographic Centres (SOCs). Examples of newly established centres are the Scripps Institution of Oceanography, which acts as the SOC for the IGOSS Sub-surface Thermal Structure Pilot Project, and the French National Oceanographic Centre, established within the French Meteorological Office, which acts as the SOC for Drifting Buoys. A draft version of the Guide to IGOSS SOCs is being circulated to IGOSS National Representatives and Centres for comment before finalization and publication in 1987.

221 The IGOSS Group of Experts on Operations and Technical Applications is studying methods to control the quality of IGOSS data in "real time" and work out codes and formats necessary for effective data exchange. To that end, it keeps close contact with the Working Group on Codes, of the WMO Commission for Basic Systems, and with the IODE Group of Experts on Format Development. The IGOSS Group of Experts on Scientific Matters is dealing with the application of new technologies to IGOSS, and particularly the use of satellite data in conjunction with in situ measurements.

222 The Chairman of the Working Committee stressed that IGOSS is in a key position to link the oceanographic and meteorological communities in the provision of oceanographic services to all Member States. With the active co-operation of WMO and IOC technical and regional subsidiary bodies, it is laying the basis for an era of operational oceanography. It can only be successful if Member States not only gather the necessary data, but also transmit them in real time, following the agreed procedures, to allow the preparation and wide dissemination of products. Benefits obtained from IGOSS are being studied; the synoptic tracking of an El Niño event is an example in which IGOSS data and products are playing an important role.

223 The Representative of WMO expressed his appreciation to the Chairman for his report and for the substantial progress in the implementation of IGOSS. In particular, he stressed WMO's continuing strong support for IGOSS, expressed most recently at the Thirty-seventh and Thirty-eighth Sessions of the WMO Executive Council (1985 and 1986) which, on both occasions, underlined the great importance of IGOSS as the appropriate mechanism for the collection and delivery of operational oceanographic data and products in support of the WCRP, the World Weather Watch, the Marine Meteorology Programme and other WMO programmes.

224 In view of the close relationship between IGOSS and these other WMO activities, the Representative of WMO stressed the need for continuing and expanding co-ordination and co-operation between the Joint Working Committee and responsible WMO bodies such as the Commission for Basic Systems (CBS) and the Commission for Marine Meteorology (CMM). In this regard, he noted in particular that the Chairman of the IGOSS Group of Experts on Operational and Technical Applications had attended the recent session of the CBS Working Group on Codes (Geneva, October 1986), and that

the Advisory Working Group of CMM had proposed the establishment of a special CMM Rapporteur on IGOSS matters.

225 The Representative of WMO briefly outlined other activities being undertaken within WMO which were contributing to the further implementation and expansion of IGOSS. These include: improvements to the WMO Global Telecommunication System (GTS), particularly in Africa and South America; close involvement in the development and implementation of new telecommunications facilities, particularly those based on satellites such as the INMARSAT system; efforts to promote IGOSS regionally through the WMO Regional Associations; and education and training activities relating to IGOSS, such as the WMO training courses on marine meteorological services and the proposed WMO courses on marine meteorology and physical oceanography. The first such course may be organized in Nairobi, Kenya, in 1988.

226 Many Delegates stated their countries' plans with regard to enhanced participation in IGOSS, stressing that the IGOSS Programme is a striking example of close and effective co-operation between the co-sponsoring organizations, IOC and WMO, as well as between the oceanographic and meteorological communities.

227 The Assembly warmly thanked the Chairman of the Joint Working Committee for IGOSS for his presentation.

228 The Assembly recognized the importance of IGOSS in providing services to different groups of users, and particularly in establishing the basis of operational oceanography. It also recognized that the behaviour of the coupled ocean-atmosphere system had to be studied and forecast and, to that end, processes occurring in the upper layers of the ocean had to be understood and monitored. In such an undertaking, IGOSS had a key role to play through co-ordinating efforts of Member States towards a common and global goal. The oceanographic community would most likely benefit greatly from improvements in the System, and meteorologists could not work properly without operational knowledge of the ocean. Operational oceanography was not only essential to the World Climate Research Programme, but also to all kinds of marine users for very practical purposes, such as navigation, fisheries, exploration and exploitation of marine resources, the operational monitoring and, if possible, forecasting, of monsoons, tropical cyclones and storm surges, etc.

229 While recognizing that significant progress has been achieved, the Assembly expressed concern that still only a handful of Member States were actually contributing to IGOSS. It recognized the need, however, to study further the requirements of Member States at different levels of development so as to better adapt the IGOSS products to specific needs. The Assembly noted that, at present, only 2 or 3 Member States are participating in this exercise, although the data would be of paramount importance to the WCRP. It called on Member States to step up the collection of data on temperature and salinity against depth and the transmission of such data in the TESAC Format, via the GTS.

230 The Assembly also expressed concern over the largely uneven distribution of IGOSS data gathered in the world ocean, and noted that the Indian Ocean was poorly covered for the time being, notwithstanding its

recognized importance for climatic studies. It urged countries whose ships were plying that ocean to make specific efforts to contribute to IGOSS to the maximum extent possible. It welcomed the offer by Mauritius to provide a focal point for the operational BATHY/TESAC programme in the region.

231 The Assembly agreed that automation of data gathering and transmission could play an important role in the development of IGOSS.

232 The Assembly noted with appreciation the specific efforts of Member States to develop the ship-of-opportunity scheme through bi- and multi-lateral exchange of equipment and expertise between industrialized and developing countries. It considered that such efforts served to meet the demand for an acceleration in the implementation of IGOSS and to provide developing countries with an opportunity to participate in implementing the System. It acknowledged with thanks the offer by Canada to host the Second Ship-of-opportunity Meeting, in Victoria, B.C., in August 1987.

233 ▲ The Assembly instructed the Secretary to study the possibility of complementing Member States' support for the IGOSS XBT/Ship-of-opportunity Programme under TEMA using extra-budgetary funds or the VCP of IOC.

234 ▲ It also instructed the Secretary to explore with the Secretary-General of WMO appropriate mechanisms for the utilization of the network of Port Meteorological Officers maintained by WMO Members, in the recruitment and operation of ships of opportunity.

235 The Assembly recognized that the development of the network of Specialized Oceanographic Centres was central to progress in IGOSS and emphasized the importance of urgent finalization of the IGOSS Guide to SOCs.

236 ▲ The Assembly urged Member States to consider volunteering to establish such Centres, at least in principle, before the publication of the IGOSS Guide to SOCs.

237 It agreed that SOCs had a key role to play in product preparation and dissemination, as well as in working out standards for data exchange in real and non-real time.

238 It emphasized the necessity for IGOSS to work closely with IODE in the development of standards and formats, in providing for compatible data sets to be prepared and archived, and acknowledged with thanks the offer by Canada to host an IGOSS-IODE Meeting of Experts in Ottawa.

239 The Assembly recognized that, in such a difficult and costly undertaking, international co-operation and mutual assistance should be developed to the greatest possible extent so as to allow developing countries to participate effectively in the System. These countries needed to increase substantially their scientific potential, to be specifically trained in IGOSS data gathering, transmitting and processing, and to be, at the same time, provided with the relevant equipment (such as XBT launchers, probes and recorders).

240 The Assembly considered that appropriate training, when duly linked to provision of equipment, was essential to increase developing countries' participation in IGOSS. It expressed satisfaction with the plans

of WMO to organize long-term training courses on Marine Meteorology and Physical Oceanography during which IGOSS and operational oceanography would be given special attention.

241 The Assembly instructed the Secretary to discuss with the Secretary-General of WMO ways and means of enabling the participation of oceanographers from concerned developing countries in these courses, and more generally, to seek increased TEMA support in the development of IGOSS.

242 The Assembly agreed that IGOSS was probably not as well known as it should be to those concerned in the Member States and therefore that a specific effort in publicizing IGOSS was needed. It noted that several products of good quality were prepared within the framework of IGOSS, but more should be done to make these products available to users.

243 The Assembly considered the widest possible dissemination of IGOSS products as a matter of high priority. In this connection, it welcomed the offer by France to study the possibility of issuing a monthly bulletin comprising main IGOSS products and of forwarding it to the interested community. In addition, the Assembly considered that benefits that could be derived from IGOSS should be drawn to the attention of appropriate national authorities within as many Member States as possible, with a view to encouraging them to give IGOSS a high priority in their national plans.

244 The Assembly restated the importance of Recommendation 3 (JWC-IGOSS-IV) adopted by the Joint Working Committee for IGOSS at its Fourth Session, to undertake a study of benefits that could be derived from IGOSS and of the possibility of undertaking a demonstration exercise on such benefits in a region to be determined. The Assembly also supported the organization of expert missions in diverse regions to mobilize increased national support to IGOSS, and to publicize the System.

245 The Assembly thanked the USA for seconding an officer to co-ordinate the operations of IGOSS and welcomed the offer by this Member State to provide for the first drafting of the IGOSS General Plan and Implementation Programme for 1989-1995, working in close co-operation with Canada and the UK.

6.2 OCEAN OBSERVING SYSTEMS

6.2.1 Global Sea-Level Observing System

246 The Chairman of the IOC Task Team of Experts on the Global Sea-Level Observing System (GLOSS), Dr. David Pugh, presented the GLOSS Implementation Plan (Doc. IOC/INF-663 rev.). He recalled that the Plan had already been considered by the Executive Council in March 1986, and in detail by the Second Session of the IOC Technical Committee on Ocean Processes and Climate, which had met immediately prior to the Assembly. GLOSS is not only a permanent primary network of stations for standardized sea-level observation, to which national, regional and scientific networks may be related, but also embodies the associated procedures for data exchange, product preparation and training. As such, it interacts with several IOC subsidiary bodies, notably IODE and IGOSS, and must be supported by a large TEMA component. IGOSS plans for TOGA were now

operational in the Pacific Ocean, and good progress was being made in the Atlantic and Indian Oceans; in the latter case, people trained on the IOC-PSMSL Courses were able to operate gauges supplied by the University of Hawaii, through the initiative of Prof. Klaus Wyrtki. The Scientific Steering Group for WOCE has discussed the number and disposition of gauges required (about 60) for calibrating satellite altimeters, but the WOCE requirements for other purposes, including needs for bottom-pressure and inverted-echosounder measurements, were still under consideration. The IAPSO advisory body that advises PSMSL met in Halifax, Nova Scotia, in 1985, and identified the advantage of relating selected tide-gauge levels to an absolute framework defined by Very Long Baseline Interferometry (VLBI) and the Global Positioning System (GPS). These advantages need to be considered by the participants in GLOSS: they include the distinction between land-level movements and changes of mean sea level. Dr. Pugh noted that the IHO would be discussing GLOSS at their Conference in May 1987. The immediate need of GLOSS was to consolidate the offers of participation, where necessary, by supplying equipment and training, under TEMA or through the IOC VCP. As the flow of data increases, products of a global and regional nature should be developed. Several possible products are already known, but the guidance of the Assembly will be an important factor in developing these ideas.

247 The Senior Technical Secretary for Ocean Dynamics and Climate, Dr. A. Tolkachev, then reported on progress in the implementation of GLOSS. Since the approval, in principle, of the GLOSS Implementation Plan (Doc. IOC/INF-663) pursuant to Resolution EC-XIX.6, 43 Members States of IOC have confirmed their participation in the System and have provided information on their stations and national GLOSS contacts; 27 countries have confirmed their need for assistance in setting up their GLOSS stations.

248 Trainees from Indonesia, Nigeria, Seychelles and Sierra Leone attended the Fourth Training Course on Sea-Level Measurements and Analysis (Bidston, UK, 23 June - 11 July 1986) with the support of IOC. The Fifth Sea-Level Training Course will be held from 22 June to 10 July 1987. France has offered to arrange a sea-level training course for scientists and technicians from French-speaking countries in 1988.

249 With IOC support, a mission of experts from the Hydrographic Institute of Portugal visited two stations in Mozambique (Pemba and Maputo), in February 1986. A French expert, Mr. J.-M. Verstraete (ORSTOM) visited Morocco, Mauritania, Senegal, Guinea, Sierra Leone, Ghana, Nigeria and Cameroon, in April 1986.

250 With the help of the University of Hawaii, in 1986, tide gauges were installed in Kenya, Mauritius and Tanzania, Diego Garcia, the Maldives and the Seychelles. Others were installed by the UK on the islands of St. Helena and Tristan da Cunha, by Pakistan, at Gwadar, and by Australia in the Christmas and Cocos Islands and at Pelabuhoum Radu in Indonesia. Australia has embarked on a programme to assist ASEAN countries (Indonesia, Malaysia, Philippines, Singapore and Thailand) in setting up their sea-level stations. The People's Republic of China has offered two tide gauges to Somalia, to support the implementation of GLOSS.

251 Development of sea-level networks in support of TOGA, WOCE and relevant regional studies was discussed at several meetings: the WMO-ICSU-

IOC Informal Planning Meeting on the World Climate Research Programme (Geneva, May 1986), the Sixth and Seventh Sessions of the SCOR-JSC Scientific Steering Group for WOCE (April, December 1986), the First Session of the IOC Regional Committee for the Central Eastern Atlantic (Praia, January 1987), the Second Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions (Havana, December 1986), the Fifth Session of the CCCO Tropical Pacific Ocean Climate Studies Panel (October 1986), and the Fifth Session of the Joint IOC-WMO-CPPS Working Group on the Investigations of "El Niño" (Guayaquil, November 1986).

The updated GLOSS Implementation Plan and a progress report on GLOSS development were considered by the IOC Technical Committee on Ocean Processes and Climate at its Second Session (Paris, 10-13 March 1987). The Technical Committee noted with satisfaction the development of GLOSS. It also noted that many developing countries, as shown in the GLOSS Implementation Plan, would need assistance in the provision and installation of tide gauges, and training of specialists. The Technical Committee also recommended the convening of a meeting of experts in 1987 in order to review and up-date the GLOSS implementation Plan and advise IOC on actions needed to improve the implementation of GLOSS. *252*

Pursuant to Resolution EC-XIX.6, close contact has been established with IHO on the development of GLOSS, which will be discussed at the Thirteenth International Hydrographic Conference (May 1987). Development of a sea-level network in the Southern Ocean will be considered at the Fifth Session of the IOC Regional Committee for the Southern Ocean (Paris, June 1987). *253*

The Representative of IHO informed the Assembly that IHO Member States have recently been requested to provide comments on, or contributions to, the draft GLOSS Implementation Plan, particularly with regard to brief descriptions of their own tidal-observing activities. As a result, a new item containing information on the IHO Member States' activities and on the IHO Tidal Data Constituent Bank, was incorporated into the Plan. He also confirmed that the Directing Committee of the IHO had decided that a Conference Item on the "Global Sea Level Observing System (GLOSS)" would be of much interest to the participants at the Thirteenth International Hydrographic Conference, to be held in Monaco from 5 to 15 May 1987. Therefore, the IHO Member States will review, during the Conference, an IOC report on progress in the implementation of GLOSS (Document IOC/PG-OPC-II/8 Annex 3). *254*

Many Delegates expressed their support and willingness to participate in GLOSS, and emphasized that GLOSS development could serve as an example of successful implementation of a service-oriented project which had received support from many countries, both developed and developing. *255*

The Delegates of Brazil, Chile, China (People's Republic of), Colombia, Cuba, Greece, Mauritius, Mexico, Pakistan, Philippines, Poland, Portugal, Spain, Turkey, USSR, Venezuela, Vietnam, and Yugoslavia informed the Assembly of their country's participation in GLOSS. *256*

The Delegate of Sweden confirmed the willingness of his country to offer 10 tide gauges for developing countries and informed the Assembly that *257*

Sweden is considering further support for developing countries by assisting in the installation of the tide gauges.

258 The Delegate of the Federal Republic of Germany informed the Assembly that his country was ready to offer an expert mission of long duration (half a year) to developing countries at the expense of his country to assist in the installation, reactivation or repair of tide gauges, upon consultation between the Secretary of IOC and relevant authorities of the Federal Republic of Germany.

259 The Delegate of the United Kingdom stated that his country would continue supporting GLOSS by organizing the next (5th) Training Course on Mean-Sea-Level Measurement Techniques, in 1987 in the Proudman Oceanographic Observatory by contributing to the IOC Trust Fund and by consultant services.

260 The Delegate of Portugal informed the Assembly that his country had already established co-operation with Cape Verde, Mozambique and São Tome, in the installation of GLOSS tide gauges and the training of specialists. He believed, however, that these countries will need some additional support from IOC. Portugal will also be willing to organize a sea-level training course in co-operation with the IOC for the Portuguese-speaking countries late this year.

261 The Delegate of Australia said his country was continuing its programme of assistance to ASEAN countries in setting up sea-level stations and training of associated specialists.

262 The Delegate of the United States stated that his country would be willing to host a meeting of the IOC Task Team of Experts on GLOSS this year.

263 The Delegate of Canada stated that the Marine Environmental Data Service (MEDS) would be willing to initiate a feasibility study with a view to accepting responsibility for a Sea-level Pilot Project for the North Atlantic, similar to the IGOSS Sea-level Pilot Project in the Pacific.

264 The Delegate of Cuba informed the Assembly that his country is considering the possibility of organizing, within the framework of IOCARIBE, a regional Seminar/Workshop on sea level in 1988 or 1989.

265 The Delegate of Indonesia informed the Assembly that 6-7 sea-level stations will be installed by June 1987 in the western part of the country (with the assistance of Australia) and several sea-level stations will be installed in October 1987 in the eastern part of the country with the assistance of the USA, and data from those stations will be made available for international exchange.

266 The Delegate of Turkey informed the Assembly that, at present, his country is operating 4 sea-level stations. The national sea-level stations network will be a main component of the proposed Turkish National Marine Observing System which will co-operate in IGOSS. His country intends to upgrade the existing sea-level stations and establish new ones, with the objective of having 16 stations in operation within four years. These

stations will be located in the Black Sea, the Sea of Marmara, the Aegean Sea, and the Levantine Sea.

267 The Delegate of the People's Republic of China, speaking highly of GLOSS, noted a few mistakes in the text of Document IOC/INF-663 rev.; for instance, "Taiwan" is listed as a "country" in the relevant Tables contained in the Document. He therefore requested that such mistakes be corrected in the forthcoming revision of the Document.

268 Some Delegates emphasized the importance of convening a seminar/ workshop on sea-level measurements in hostile conditions, particularly in Antarctica.

269 ▲ The Assembly requested the Technical Committee for the Southern Ocean, at its Fifth Session (June 1985), to initiate an exchange of views and experience on this matter.

270 ◗ The Assembly supported the proposal of the Technical Committee for Ocean Processes and Climate to strengthen the IOC activities jointly with the Division of Marine Sciences in improving and expanding TEMA activities in support of GLOSS, with regard to provision of tide gauges, spare parts, assistance in their installation and maintenance, and training of technicians to enable developing countries to participate in operational observational programmes, on the one hand, and with regard to the training of specialists on the data analysis and interpretation for scientific and practical applications, on the other.

271 ◗ ▲ The Assembly agreed that IOC regional bodies are a proper framework for implementation of GLOSS in their respective regions. It noted with satisfaction that, at the recent Sessions of IOCEA (Praia, Cape Verde, January 1987) and IOCARIBE (Cuba, December 1986), GLOSS regional networks had been adopted. The Assembly invited the Chairmen of IOC subsidiary regional bodies to consider the implementation of the regional components of GLOSS at their forthcoming sessions and to consider the designation of Regional Co-ordinators for GLOSS, to promote, inter alia, sea-level data submission to international centres and the installation of GLOSS sea-level stations in their respective regions.

272 The Assembly expressed its thanks to Australia, Canada, China (People's Republic of), France, Portugal, UK, and USA for their support of GLOSS by assisting developing countries.

273 ◗ The Assembly endorsed the conclusions and Recommendations on GLOSS (see Resolution XIV-2, paragraph C). of the Second Session of the Technical Committee on Ocean Processes and Climate.

6.2.2 Drifting-buoy Requirements

274 The IOC Assistant Secretary, Mr. Y. Tréglos, introduced this subject. He recalled that the Executive Council, through Resolution EC-XIX.7, accepted "the invitation of WMO to co-sponsor the Drifting-Buoy Co-operation Panel, with the participation of interested Member States of IOC and Members of WMO". The Panel held its Second Session in Geneva, from 15 to 17 October 1986, and discussed, inter alia, problems encountered with the

appointment of a Technical Co-ordinator for the Panel. Among these problems, it was stressed that, on the one hand, delay in the receipt of funds in the IOC Trust Fund made it impossible to sign any contract to fill the position, and, on the other hand, funds committed for the position fell short of those the Panel believed were required to allow the Technical Co-ordinator to work effectively, especially to provide for expected travels. The Panel therefore urged the countries contributing to the cost of the Technical Co-ordinator to forward the funds according to specific procedures (which were given in detail) and in due time; that is, at the latest some three months before the expected date on which contracts should be signed (account not being taken of other possible delays due to national administrative problems).

275 The difficulties mentioned above were, nevertheless, overcome and the Technical Co-ordinator for the Panel is expected to be recruited in June 1987. This would allow the Panel effectively to undertake the practical tasks for which it had been set up and to report on matters of substance to the Executive Council at its next Session. To this end, the Panel agreed on the content of its annual report to the IOC and WMO governing bodies and on a schedule for the preparation of the report.

276 The Executive Council had also instructed (Resolution EC-XIX.7) the Secretary to explore the legal aspects of the operation of drifting-buoy and other Ocean Data Acquisition Systems (ODAS), in consultation with IMO and WMO. As a result of the consultation, which took place during the intersessional period, it was agreed that a first step would be to make a compilation of existing rules and regulations and other related material. A consultant should be hired to assist with this compilation which would serve as a basis for further action including the convening, if later decided by Member States of the organizations concerned, of a plenipotentiary conference on the subject.

277 Some Delegates expressed their concern that action undertaken by the Secretariat pursuant to Resolution EC-XIX.7 was going slowly as far as the legal status of drifting buoys was concerned. They emphasized that this question was of utmost importance in that it addressed matters such as the ownership of the buoys and of the data, drifting-buoy passage in waters under national jurisdiction, liability, responsibility, respect of compulsory security measures with regard to navigation safety, transfer of technology, etc. Countries were already facing such problems which had to be looked into.

278 Other Delegates stressed that, notwithstanding the importance of legal matters to the operation of drifting buoys, IOC had to take into consideration its limited budget and staffing. Legal problems were highly complex and specialized and would probably be better handled by other organizations such as IMO, with the support of, and input from, the Commission. The latter should mainly focus it efforts on scientific and technical questions.

279 The Delegate of Brazil recalled that the Executive Council, at its Nineteenth Session, had instructed the Secretary to explore the legal aspects related to drifting buoys and to submit his findings to the Assembly at the present Session. He noted that the Secretary has initiated consultations on the matter with IMO and WMO, but that no conclusive work

has been done, and believed that this slow progress was a matter of concern. His Delegation was not fully satisfied with the information given on the activities of the Drifting Buoy Co-operation Panel and of the present operation of drifting buoys, or with the way this very important aspect of ocean observation is being managed. He believed that the legal implications of the use of such buoys should have already been clarified; for example, responsibilities related to potential damage caused by, and to, the buoys must be thoroughly discussed on the basis of competent advice, so that the Commission's future involvement is clear. The question of access to drifting-buoy data must be clearly defined, especially for those countries to which the data are directly relevant; the quality and completeness of the data to be transmitted to countries concerned must be assured. Also, the use of buoys in jurisdictional waters must be subject to the prior consent of the coastal States, even if the nature of drifting-buoy operations presents difficulties in this respect. The Delegate of Brazil also called for a clear definition of how the technology for manufacturing and deploying drifting buoys should be transferred, so that international co-operation in this field could effectively be enhanced. He also believed that the Commission should examine the allocation of resources to the management and co-ordination of the drifting-buoys programme, in the light of Rule of Procedure No. 55. He restated his country's interest in the drifting-buoy programme, and its willingness to co-operate fully in this field.

280 The Assembly noted the report on the activities of the Drifting Buoy Co-operation Panel and the delays in recruiting a Technical Co-ordinator for the Panel. Acknowledging the funds already committed to support the post, it thanked the countries concerned. It urged as many other Member States as possible to take an active part in the Panel's work and to contribute to supporting the Technical Co-ordinator's post so as to ensure its continuation in future years.

281 The Assembly agreed that the legal question relating to drifting buoys were important to Member States and therefore should be given the desired attention within the Commission's programme of work; it instructed the Secretary to proceed step by step in this matter. It therefore endorsed the actions already initiated (i.e., that all documentation dealing with the subject should be brought together and a compilation of existing legal material covering also the relevant technical aspects, such as identification markings, prepared for further consideration by Member States). It stressed in addition that technical aspects of the use of meteorological and oceanographic drifting buoys were closely linked with the legal aspects thereof. Therefore, there should be close collaboration in this undertaking between IOC, WMO and IMO, the latter playing a key role in dealing with legal aspects.

282 The Assembly reaffirmed its support for participation in the major drifting-buoy programmes being developed, such as the programme relating to the Southern Ocean. It urged Member States to make sure that buoy deployers make their data freely accessible by exchanging them in the agreed code forms over the Global Telecommunication System (GTS) of WMO. It acknowledged the work undertaken by the Canadian Marine Environmental Data Service (MEDS) which acted as Responsible National Oceanographic Data Centre for drifting-buoy data, and, as such, provides access to all quality-controlled drifting-buoy data. It urged Member States already involved in the development of drifting-buoy technology and deployment to assist other interested countries

in developing their own drifting-buoy programmes through appropriate technology transfer, if possible by making use of appropriate existing mechanisms such as the Drifting-Buoy Co-operation Panel.

6.2.3 Future Requirements for Ocean Monitoring

283 The Chairman of the IOC Technical Committee for Ocean Processes and Climate, Dr. Klaus Voigt, introduced this subject. He reminded the Assembly that it was requested to evaluate the proposals for future ocean monitoring and provide guidance to the technical and regional subsidiary bodies concerned on the development of ocean monitoring.

284 The Chairman of the Technical Committee informed the Assembly of the outcome of the discussion of this matter at the Second Session of the Technical Committee for Ocean Processes and Climate (Paris, 10-13 March 1987). The Technical Committee considered the application of acoustic doppler current profilers and other new technology being developed for ocean observations, particularly in support of WCRP. It noted that, in developing global ocean observing systems and in introducing new technology for oceanographic observations, particular attention should be given to the problem of standardization and intercalibration of measurements by different instruments so that scientists could have access to continuous and compatible historical records for long-term research, particularly for climate studies.

285 The Assembly noted that some action had already been taken by SCOR, by the Joint SCOR-IOC CCCO, and by the Technical Committees for IGOSS and IODE on new technology development and the problem of intercalibration, and standardization, and data compatibility.

286 The Assembly agreed that this problem should be given high priority by the Technical Committee for Ocean Processes and Climate and other concerned subsidiary bodies (IGOSS, IODE) taking into account the advice of the relevant expert groups of SCOR, the Joint SCOR-IOC CCCO and IGOSS.

287 The Assembly endorsed Recommendation PG-OPC-II.3 of the Technical Committee regarding requirements for ocean monitoring, as well as a proposal on the preparation of a report on new technologies being developed for ocean observations, contained in Recommendation PG-OPC-II.2 (see Resolution XIV-2 in Annex II to the present Report).

6.3 INTERNATIONAL OCEANOGRAPHIC DATA EXCHANGE AND MARINE INFORMATION MANAGEMENT

6.3.1 Developing IODE to Meet New Ocean Data Requirements of Scientific Programmes and Services

288 The Chairman of the IOC Technical Committee on IODE, Dr. N. C. Flemming, presented the Summary Report of the Committee's Twelfth Session. He reported substantial progress in all the main fields of endeavour, with major contributions in support of the World Climate Research Programme, GIPME, IOC regional programmes, OSLR and OSNLR. He reminded the Assembly

that the principal users of oceanographic data archived in data centres of the IODE System are: international agencies and planning and development groups at the regional level; coastal and offshore industries, such as fishing, shipping, petroleum, coastal protection; national and international scientific programmes. Many thousands of enquiries are answered by the NODCs within the IODE system each year.

289 The international marine data base now contains data from more than 2 000 000 observations. Included in the data totals received by the World Data Centres (Oceanography) are data from more than 80 000 oceanographic stations; the number of oceanographic stations for which data are held by the Centres now exceeds 900 000, and 400 000 bathythermographic profiles are being archived. Other data holdings in the Centres include biological observations, series of current observations and pollution data. A large number of geological and geophysical measurements are held in the World Data Centre (Geology and Geophysics) in Boulder, Colorado. Five new National Oceanographic Data Centres have been established bringing the total number of NODCs and DNAs to 40. Thirteen RNODCs have been in operation.

290 To promote the use of the IODE system several leaflets and brochures and a series of large coloured posters have been published.

291 The Chairman emphasized that the last two years have marked an evolutionary change in the approach to data management within IODE, and that, in the last two years, the Technical Committee has changed from identifying problems in data management to identifying solutions, although much effort is still needed to give effect to those solutions. He gave a few examples of the actions taken by the Committee to overcome the delays in submission of data, and technical problems with transmission and storage of data, to assist developing countries in meeting their needs in marine information and data management. These actions include: the revision of the Terms of Reference of existing Groups of Experts to meet new requirements for timely data submission and exchange; the arrangement of trials of the high-speed SPAN data network; the development of open on-line access to information and data inventories of NODCs; the decision to work out unified quality control procedures; preparation of new GF3 subsets for TOGA and WOCE parameters and the installation of GF3-Proc in the IODE data centres; expansion of the RNODC network to facilitate data exchange and provision of services for regional and international programmes; identification of ways to manage large volumes of data such as those collected by satellites and high-resolution, high-capacity instruments. The Chairman of the Technical Committee especially stressed that present resources in the data centres of the IODE system are probably less than half those needed to ensure an efficient distribution and archiving, even of the present data volumes. Reasonable predictions based on published reports suggest that the requirement for data exchange will accelerate continuously into the 1990s, with probably a 10-fold increase in effort required to store, archive and provide services from the huge data volumes produced by projected observing systems. He stressed the vital importance, in this situation, of finding extra resources to strengthen the NODC at the national level, and of supporting the data-management infrastructure at the international level.

292 The Delegate of Turkey recalled that, during the last Assembly, he had announced the Turkish offer to host an oceanographic data-processing

summer school sponsored by IOC. The Summer School will now take place in Erdemli, at the Marine Science Institute, this autumn; a programme, including 5 days on-board training, has been drawn up. Trainees will be drawn from the Mediterranean and Black Sea regions.

293 The Delegate of the Federal Republic of Germany informed the Assembly that his National Oceanographic Data Centre (DOD) has already increased the number of staff members significantly so as to meet the requirements for an acceleration of the processing and international exchange of oceanographic data. At the same time, the activities of the DOD will be broadened to the processing of data which were collected in national and international pollution monitoring programmes.

294 The Assembly thanked the Chairman of the Technical Committee on IODE for his detailed introduction and expressed its appreciation of the activities of the Technical Committee. It also gave special credit to the past Chairman of the Committee on IODE, Prof. D. Kohnke, and the IODE Officers for their devotion and energy which had been so productive and resulted in considerable progress in the implementation of the programme.

295 The Assembly thanked the USSR for the excellent facilities and warm hospitality it had provided for the Twelfth Session of the Technical Committee on IODE.

296 The Assembly noted the information on the national activities and expressed its satisfaction with increased interest of Member States in oceanographic data and information management.

297 ▲ The Assembly encouraged Member States to find mechanisms to increase support at the national level to the development and improvement of their national oceanographic data centres. It emphasized the importance of co-operation at the bilateral, multi-lateral and regional levels, bearing in mind that it will result in increased flow of data internationally and the synthesis of large data sets at the regional level.

298 ▲ The Assembly believed that one of the ways to improve collaboration in oceanographic data and information exchange is wider use of micro-computers and improvement of communication channels between data centres. The Assembly recognized that this is a costly exercise and called on Member States to assist in the implementation of this project through VCP or the Trust Fund. The Assembly instructed the Secretary to approach international funding agencies and other international organizations in order to obtain financial support for this project.

299 ◗ The Assembly approved the Summary Report of the Twelfth Session of the Technical Committee on IODE and the Resolutions and Recommendations contained therein, as well as those given in Document IOC-XIV/8 Annex 1.

300 ▲ ◗ The Assembly requested the Technical Committee to continue its efforts to find ways to co-operate closely with existing data-management systems other than IODE and fully supported the decisions of the Technical Committee to test a distributed data centre approach in an attempt to link the IODE System with the data banks of national laboratories and other scientific institutions.

301 The Assembly restated the importance of the IODE system for meeting the requirements of different groups of users and welcomed the offer of the Representative of ECOR to establish close contacts with the engineering community in the field of automatic data handling and transmission.

302 The Assembly expressed its satisfaction with the increased level of co-operation between the Joint IOC-WMO Committee for IGOSS and the IOC Technical Committee on IODE; it also expressed its full support for the organization of a Joint IGOSS-IODE meeting of experts at the beginning of 1988. The Assembly acknowledged with thanks the offer of Canada to host this meeting.

303 The Assembly endorsed the steps taken by the Technical Committee in support of the oceanographic component of the World Climate Research Programme, particularly in the establishment of a number of the IODE subsidiary bodies to meet the data-management objectives of TOGA and WOCE, to develop GF3 subsets for selected TOGA and WOCE parameters through the establishment of data-type RNODCs, such as RNODC-Currents.

304 The Assembly acknowledged with thanks the UK offer to host the meeting of the Group of Experts on RNODCs and Climate Data Services, in the fall of 1987, and the US offer to host an Ocean Data Management Workshop, in 1988.

305 ▲ The Assembly stressed the importance of improving data-monitoring procedures, including NOP announcements and ROSCOP form submission and of the decision to establish an electronic bulletin board for operational provision of information. The Assembly instructed the Secretary to explore ways and means to put into action this information system.

306 The Assembly agreed that the quality of the data is an important prerequisite for successful numerical modelling of oceanographic processes and welcomed the decision of the Technical Committee to pay more attention to the question of unified quality-control procedures.

307 ◗ ▲ The Assembly concurred with the view of the Technical Committee on the importance of the further development of the IODE Data Centre Services to meet the increasing needs of developing Member States in oceanographic data products and instructed the Secretary to organize ad hoc expert consultations in 1988 on this matter. The Assembly considered that it is particularly clear that newly formed NODCs can benefit greatly from shared experience and test exercises with existing data sets.

308 ▲ Noting the need for remotely sensed oceanographic data in various international programmes, as well as the need for data which were earlier considered by the IODE as non-standard, the Assembly encouraged Member States to assist NODCs to develop the capability for acquiring and processing level-2 remote-sensing data sets and instructed the Secretary to provide support to the organization of a Workshop on Satellite-derived SST Data in 1988/89. The Assembly acknowledged with thanks the offer of Argentina to host this Workshop.

309 ◗ The Assembly welcomed the decision of the Technical Committee to appoint a Rapporteur for the Banking of Marine Chemical Data and supported

the idea of convening an ad hoc meeting of experts in marine chemistry, during the intersessional period.

310 The Assembly appreciated the efforts made by Argentina, Canada, FRG, India, Japan, UK, USA, and USSR in training experts from developing countries in oceanographic data and information management. The Assembly called on the IOC Member States to continue their support for TEMA activities within IODE.

311 Noting the success of the IOC consultant missions in helping to establish new NODCs, in improving the infrastructure for oceanographic data management at the regional level and in promoting marine data management, and noting also the requests from some IOC Member States (Cuba, Indonesia, Ireland, Mexico, ROPME countries, Thailand) for consultant services, the Assembly instructed the Secretary to organize workshops and arrange, within the budget available to the Commission or by the use of other sources of funding, national and regional advisory missions to these Member States and to develop proposals for projects to be funded from extra-budgetary funds.

312 The Assembly adopted Resolution XIV-8.

6.3.2 Marine Information Management

313 The Chairman of the Technical Committee on IODE, Dr. N. C. Flemming, introduced this subject. He pointed out that marine information as a basic tool for the transfer of knowledge is seen as being directly relevant to the conduct of marine science. In view of the strong interest in improving libraries and documentation centres, it is recognized that marine information, in many cases, can be developed as a precursor to marine data management in developing countries.

314 Taking into account the important place that marine information management now takes in the work of the Technical Committee, the Twelfth Session recommended that the name of the Committee be changed to the Technical Committee on International Oceanographic Data and Information Exchange.

315 The Chairman of the Technical Committee stressed the achievements of the IOC's programme in this field during the intersessional period in the face of heavy demands, noting the contribution made by the IODE Group of Experts on Marine Information Management (GEMIM). The Aquatic Sciences and Fisheries Information System (ASFIS), sponsored jointly by IOC, FAO and the UN(OETB), has been strongly supported. The ASFIS Thesaurus, a major bibliographic tool for marine science libraries, was published in 1986 and the input system for the Aquatic Sciences and Fisheries Abstracts (ASFA) has been strengthened by the addition of an input centre in China. ASFA is now recognized as the leading abstract service covering all aspects of marine science. He noted however that the production of the Handbook on Marine Scientific and Technological Information Resources has not progressed as well as anticipated.

316 The Chairman of the Technical Committee then described the important effort devoted to regional workshops in Goa, India, March 1986 and Cartagena, Colombia, July 1986 and the advice and assistance given to

several regional development initiatives. He concluded by noting the support given by the Twenty-fifth Session of ICSPRO (3-5 February 1987) to the preparation of a strategy for MIM, noting that, under the leadership of the new Chairman of the GEMIM, Dr. J. Caponio, work on this initiative has already commenced.

The Assembly welcomed the production by China of a Supplement to the International Directory of Marine Scientists listing Chinese specialists, which had been issued with the support of the Unesco Division of Marine Sciences. 317

The Assembly noted the publication and distribution of the Second Edition of the MEDI Catalogue and the need for a major revision of the MEDI system to adapt to the many changes both in marine science and in information technology in the past decade. The Assembly welcomed the offers of the USA and USSR made at the Twelfth Session of IODE to undertake preliminary studies on MEDI revision and supported the need for a small ad hoc consultation of experts to review the results of these studies and to make detailed proposals on the future design and operation of MEDI. 318 ▲

The Assembly was informed that ASFA database entries from 1982 are now available on CD-ROM for use on personal computers. A single laser disk holds at least five years of output representing around 150 000 abstracts and includes software to run database searches. Several Delegates stressed the potential of this medium especially for developing countries, noting that some Member States may require TEMA support to install it. 319

The Assembly recognized the necessity of a strategic plan to guide the Commission in the field of Marine Information Management. This strategy must balance and integrate the priorities and resources required in several different areas, mentioned below, so as to avoid unnecessary duplication of effort with consequent inefficiency, to optimize available resources and manpower. These areas include inter-agency co-operation, improvement of regional infrastructures, production and dissemination of publications using modern technology, effective gathering of information, and the implementation of new planning methods on a continuing basis. The Assembly instructed the Secretary to make a major effort to solicit necessary funding support to develop the strategic plan for marine information management and, especially, the assistance components required by developing countries. 320 ▲

The Assembly noted that, in the last few years, there has been a great increase in the number of regional and national initiatives in the marine information field. Faced with spiralling literature costs and diminishing availability of foreign currency, many Member States see national and regional co-operation as one of the posible approaches to meeting information needs. The Assembly recommended that the development of networks adapted to each regional situation, linked to the appropriate IOC Regional Subsidiary Bodies and co-ordinated with the relevant regional bodies of other related international organizations, be considered when defining the strategy. 321 ▲

The Assembly noted with appreciation the close collaboration built up between the Commission and other bodies concerned with information management, particularly the organizations members of ICSPRO. The Assembly recognized that the future demands for marine information are best met by 322 continuing and widening this collaboration, making full use of all the financial, human and material resources available, and that the strategy should be based on these premises.

323 The Assembly endorsed the request made by ICSPRO, at its Twenty-fifth Session, that the requirements for the ASFIS Registers be appropriately addressed in the development of the strategy. The Assembly recognized that the ASFIS Registers and others reference mechanisms meet a real need in Member States, and contribute to effective management of ASFIS and of the information concerns of the ICSPRO organizations. It noted that the generation of information products can be made more efficient and economic by the increased application of modern information processing techniques. The Assembly instructed the Secretary, in collaboration with the ASFIS co-sponsoring organizations, to give priority to the maintenance of the Institutions Register, the International Directory of Marine Scientists, the Register of Oceanographic Research Vessels and the List of Acronyms and Abbreviations, in view of the demand for them in the marine science community.

324 Increasing the availability to users in Member States of the information they need for their science and their economic development is a long-term endeavour, as is the development of ocean services in general. Noting that, at present, there is no staff member of the IOC Secretariat exclusively devoted to marine information management, the Assembly stressed the need for greater resources, especially a full-time professional, assigned to the IOC Secretariat for the maintenance of these registers.

325 The Assembly adopted Resolution XIV-9.

6.4 INTERNATIONAL TSUNAMI WARNING SYSTEM IN THE PACIFIC

326 The IOC Senior Assistant Secretary in charge of Ocean Services, Dr. I. Oliounine, introduced this subject. He informed the Assembly of the development of the Tsunami Programme which is a striking example of a successful international programme involving IOC Member States, with direct responsibility for mitigating the effects of tsunamis, to save lives and property. The last two years, following the Tenth Session of the IOC International Co-ordination Group for ITSU (Sidney, B.C., 1-3 August 1985) marked some important achievements: the draft of the Master Plan was finalized; tsunami travel-time charts were prepared or improved; a revised version of the IOC Manual entitled "Wave Reporting Procedures for Tide Observers in the Tsunami Warning System" was completed. These technical and strategy matters will be discussed at the Eleventh Session of the International Co-ordination Group for ITSU, which will take place in September 1987 in Beijing, People's Republic of China. He informed the Assembly of plans to have an International Symposium on Storm Surges straight after the ICG session; the Symposium will be co-sponsored by China and IOC, and China will also host the ICG.

327 The IOC Senior Assistant Secretary emphasized the importance of increased support from Member States to the activities of the ITIC to allow it to continue to function effectively and for the proper servicing of Member States. He referred to the need to nominate candidates for the post

of Associate Director of the Centre and recalled the IOC Circular Letter No. 1049 of October 1985 in this regard.

328 In response to the decisions of the Nineteenth Session of the IOC Executive Council, the Secretary IOC gave the required priority to providing support to the activities of the International Tsunami Information Centre and to organizing training under the Visiting Experts Programme. Four tsunami experts have been trained at ITIC, and extensive monitoring and research programmes have been implemented by the Centre covering the preparation of a tsunami glossary and a historical data base for operational analysis, as well as publication of the Tsunami Newsletter and other activities.

329 The Assembly was informed of the technical assistance project proposal for a regional tsunami warning system in south-east Asia, and the efforts of the Secretariat to mobilize extrabudgetary funding through, inter alia, UNDP.

330 The Delegate of Chile informed the Assembly of the preparation in his country of a Standard Operational Plan for the National Tsunami Warning System.

331 The Assembly expressed its satisfaction with the results achieved by the International Co-ordination Group.

332 ◗ The Assembly supported the publication of additional Tsunami Travel Charts for locations as identified by the Editorial Group Meeting on Tsunami Travel-Time Charts (March 1986, Honolulu, USA).

333 ▲ The Assembly thanked the Government of China for providing facilities for the Eleventh Session of the ICG and the related Symposium. It instructed the Secretary to distribute the invitations as soon as possible.

334 ▲ The Assembly restated the importance of appointing an Associate Director of ITIC and called on Member States to take necessary actions to meet this long-standing requirement. As a tentative measure and in the absence of any nomination for an Associate Director, the Assembly instructed the Secretary to study the possibility of providing extrabudgetary funds for hiring an assistant, at least on a part-time basis, for ITIC.

335 The Assembly recognized the importance of TEMA activities in support of ITSU and emphasized the importance of continuous support to the Visiting Experts Programme and the ITIC activities.

336 ▲ The Assembly noted with concern that, in spite of the decisions of the Nineteenth Session of the Executive Council and long and continuing efforts of the ITSU Officers and IOC Secretariat, funding of the project proposal on a tsunami warning system in south-east Asia has not been forthcoming from the UNDP or other funding agencies and recommended that, since UNDP funds are limited, Member States concerned give the required priority to this project because of the long-term socio-economic benefits of disaster-prevention measures and the humanitarian nature of the project, and to call on UNDP or other appropriate funding agencies to fund it.

337 ▲ The Assembly requested the Member States to keep the Secretary informed of actions taken to promote funding for the aforementioned project.

338 ▲ The Assembly noted with interest information submitted by the Delegate of Chile on the Chilean Standard Operational Plan for a National Tsunami Warning System and recommended the International Co-ordination Group for ITSU to study this Plan carefully at its coming Session with a view to using it as a model for other national operational plans, if appropriate.

7. REGIONAL SUBSIDIARY BODIES

339 Several Delegates made general statements on the role of the Commission's regional subsidiary bodies.

340 The Delegate of Egypt briefly described the special characteristics of the Red Sea and the wide range of scientific study thereof: geology, biology, petroleum exploration and exploitation, and the related marine pollution; the Red Sea is also subject to heavy maritime traffic. At the same time, it is not generally speaking a region of broad international co-operative investigation. Moreover, the ALECSO Programme on the Environment of the Red Sea and the Gulf of Aden (PERSGA) is organizing and co-ordinating regional co-operation in the study of this semi-enclosed sea. He therefore suggested that IOC should make full use of PERSGA as a regional instrument for achieving the Commission's aims in this special region.

341 The Secretary recalled the analogous use already being made, by the Commission, of appropriate regional bodies such as the International Council for the Exploration of the Sea (ICES), in the North Atlantic region, the International Commission for the Scientific Exploration of the Mediterranean Sea (ICSEM), and the Comisiòn Permanente del Pacìfico Sur (CPPS), in the south-east Pacific. He noted the similar situations of the Black Sea, the Baltic Sea and the Red Sea, which were all semi-enclosed and under study by specific regional bodies, and reminded the Assembly that the IOC does not normally create regional subsidiary bodies in the fields of marine science and ocean services if a competent regional body already exists.

342 ◗ ▲ The Assembly decided that the Commission's interests in respect of the Red Sea and Gulf of Aden should be promoted preferably through PERSGA and instructed the Secretary to pursue joint negotiations with ALECSO and PERSGA to that end with a view to drawing up a Memorandum of Understanding between IOC and ALECSO/PERSGA on co-operation in this field. This decision should be taken into account when considering the area covered by IOCINDIO.

343 The Delegate of the USA regarded the Commission's regional subsidiary bodies as a mechanism of interaction between developing and developed countries, but was concerned that the Commission often establishes subsidiary bodies without adequate resources. To be useful, regional subsidiary bodies ought, in his view, to meet every other year, with an activity such as a scientific symposium being convened between the biennial meetings of a given subsidiary body. Also, each regional subsidiary body should be serviced full-time by a staff member, whose primary responsibility

is to serve the body, with full support for communications and travel, outposted to the respective region. He recognized that, although US marine research interests were world-wide, their marine scientific expeditions to different regions were episodic (often every 3-5 years) and were not therefore always compatible with the operations of a given subsidiary body. He suggested that, in some regions, the sponsoring, by IOC, of special regional or sub-regional studies such as Physical Oceanography in the Eastern Mediterranean (POEM), perhaps be combined with meetings of Member States from specific regions during Assemblies. In any case, he believed that the Commission must adapt its mechanisms for regional co-operation to the specific characteristics of each region.

The Delegate of the USSR shared some of these concerns. However, he stressed the importance of regional oceanographic phenomena (e.g., El Nino, Somalia Current and monsoons) to the understanding of global phenomena and processes. Problems must be solved at all levels, not simply cut up into pieces. 344

The Delegate of Denmark emphasized the global nature of some programmes, such as Ocean Dynamics and Climate, and the more regional or local nature of others, such as marine pollution. 345

The Delegate of Australia stressed the long time it takes to develop an effective and dynamic regional subsidiary body, such as WESTPAC, because, during the initial period, it is necessary to raise the awareness of scientists in the region to the advantages of regional co-operation and the new scientific opportunities that thus become available. To be justified, however, such regional subsidiary bodies must move on from the awareness-raising phase to the implementation phase, where these research opportunities are taken up. 346

The Delegate of Canada informed the Assembly that, as an example, the Dumping Protocols under UNEP Regional Seas Action Plan Conventions call for scientific advice of the type provided by GIPME, and this was a potential source of duplication of effort at the regional level. He suggested that the proposed study of joint regional expert groups with UNEP be expanded to consider for each region the appropriate IOC mechanisms for effective promotion of regional co-operation. 347

The Secretary agreed with the Canadian proposal to expand the remit of the proposed Study Group. He reminded the Assembly of the psychological importance of regional meetings compared with ad hoc meetings during Assemblies, and that the upgrading of a Regional Committee to a Sub-Commission was a mark of maturity which must, however, be accompanied by commensurate Member States' support through the secondment of staff, or by other means, if implementation is to become effective. He noted also that the regional subsidiary bodies played a very important role in contributing to a better knowledge of regional marine scientific problems, and by contributing to the implementation of IOC global programmes, thus serving both kinds of interest and bringing together developed and developing countries. 348

The Secretary took the opportunity to thank the Delegate of Iraq for having translated two important IOC documents (the Report of the Secretary on Intersessional Activities, to the Nineteenth Session of the 349

Executive Council, and of IOC Workshop Report N° 37 - IOC-Unesco Workshop on Regional Co-operation in Marine Science in the Central Indian Ocean and Adjacent Seas and Gulfs) into Arabic so as to make them more accessible to the scientific communities of the Member States concerned.

350 ▲ The Assembly instructed the Secretary to include in the study on joint IOC-UNEP regional bodies (see Section 8,3, below) an analysis of present and eventual IOC mechanisms for improved regional co-operation amongst its Member States.

7.1 SUB-COMMISSION FOR THE CARIBBEAN AND ADJACENT REGIONS (IOCARIBE)

351 The Chairman of the Sub-Commission, Mr. Rafael Steer-Ruiz introduced this subject. He reviewed intersessional activities as detailed in the Summary Report of the Second Session of the Sub-Commission for IOCARIBE (Havana, Cuba, 8-13 December 1986). He highlighted the following regional components of the major IOC global programmes that were approved by the Sub-Commission at its Second Session:

(i) A Workshop on Physical Oceanography and Climate (Cartagena, Colombia, 17-22 August 1986) proposed an IOCARIBE Programme on Sea-Level/Weather Monitoring of the Caribbean Sea and Adjacent Regions, which was adopted by the Sub-Commission.

(ii) In the framework of the CARIPOL (Caribbean component of GIPME/MARPOLMON) Programme: an IOC-UNEP Symposium on the Review of Petroleum Hydrocarbons in the Caribbean was held in Mayaguez, Puerto Rico, 1-6 December 1985, and an IOC-UNEP Training Workshop on Analysis of Petroleum Hydrocarbons in Sediments and Biota was held in Puerto Morelos, Mexico, 10-22 November 1986. The Chairman of IOCARIBE informed the Assembly that a Swedish Associate Expert had been outposted to the IOC Secretariat for IOCARIBE in February 1986. IOCARIBE will soon be able to benefit from an IOC staff member outposted to the UNEP Regional Co-ordination Unit in Jamaica, supported by UNEP. Based on the results of these two meetings, the Sub-Commission expanded its activities under CARIPOL to include, inter alia, biological effects studies and open-sea baseline studies. It also decided to create a Group of Experts on Marine Pollution Research and Monitoring in the Caribbean and Adjacent Regions to replace the informal CARIPOL Steering Committee.

(iii) In the context of the OSLR Programme, the Sub-Commission endorsed the recommendations of the IOC-FAO Workshop on Recruitment in Tropical Coastal Demersal Communities (TRODERP) hosted in Ciudad del Carmen, Mexico, 21-25 April 1986 by the Universidad Nacional Autónoma de México (UNAM) and the Secretaría de Pesca de México. The Sub-Commission also supported the organization of the Second Western Atlantic Turtle Symposium (WATS-II) to be held in Mayagüez, Puerto Rico, 12-16 October 1987, and decided to pursue an initiative to respond to mass fish-mortality phenomena in the Caribbean region.

(iv) Within the OSNLR Programme, two missions of the Chairman of the Guiding Group of Experts on OSNLR were carried out in November 1985 and February 1986 in the region. The Sub-Commission endorsed the recommendations of an IOCARIBE Mini-symposium on the Regional Development of OSNLR, which was held immediately prior to the Second Session of the Sub-Commission. At the Second Session of the Sub-Commission, Venezuela offered to host a workshop on coastal geology and to provide one- to two-month training fellowships for regional marine geologists. The Chairman also informed the Assembly that negotiations with France to outpost a French marine geologist to the IOC Secretariat for the Sub-Commission are well advanced.

Regarding regional components of Ocean Services, the Chairman of IOCARIBE emphasized the need expressed by Member States of IOCARIBE to clarify benefits to countries concerned through participation in systems such as IODE and IGOSS. In this context, Colombia has offered to host a regional course on organization, structure, operation and, in particular, the needs of oceanographic data centres. 352

In terms of establishing a regional information management system in the framework of ASFIS, further study of previous proposals was recommended to ensure the best possible use of the ways and means available or expected to be provided under various proposed assistance projects. The same approach was suggested with the initiative on a regional network of higher education and research institutions. 353

The Chairman of IOCARIBE pointed out the excellent co-operation developed at the regional level with UNEP and FAO and expressed the Sub-Commission's hope that a similar degree of co-operation could be developed with components of the COMAR/COSALC Project of the Unesco Division of Marine Sciences. 354

Regarding arrangements for establishing the IOC Secretariat for IOCARIBE, the Delegate of Colombia informed the Assembly that, although the corresponding agreement between Unesco and Colombia had not yet been signed, it was expected to be signed during the visit of the Director-General of Unesco to Colombia, 3-5 April 1987. Nevertheless, offices and resources for the Secretariat have been already provided. He also informed the Assembly that his country is considering hosting the Third Session of the Sub-Commission in Cartagena. 355

Several Delegates expressed their satisfaction with the dynamic implementation of the Commission's programme in the IOCARIBE region. 356

Various Delegations emphasized that the success of the Sub-Commission basically depends on the support provided to IOCARIBE by Member States through, for instance, specific contributions to the IOC Trust Fund and secondment of staff, and on the decision to outpost a senior staff member to assume the responsibility of IOC Senior Assistant Secretary for IOCARIBE. 357

The Delegate of Mexico stated that the IOCARIBE experience demonstrates that IOC regional mechanisms are efficient tools for incorporating developing countries into major IOC scientific programmes and ocean-observing systems; he emphasized the need to clearly identify TEMA components for these programmes, as was done at the Second Session of the Sub-Commission. 358

359 The Delegate of Venezuela, in the context of the OSNLR Programme in the region, offered to host a workshop on coastal geology, sedimentary dynamics and management of the coastal zone.

360 The Delegate of Cuba offered to host a workshop on strengthening the regional component of GLOSS.

361 The Assembly endorsed the Summary Report and Recommendations of the Second Session of the Sub-Commission. It thanked Cuba for the excellent facilities it had provided for the Second Session of the Sub-Commission and the associated Mini-symposium on the Regional Development of OSNLR, and acknowledged with thanks its offer to host a workshop on strengthening GLOSS in the region.

362 The Assembly expressed its great appreciation to the Colombian Government for the facilities made available for the IOC Secretariat for IOCARIBE.

363 The Assembly also acknowledged with thanks Venezuela's offer to host a workshop on coastal geology and coastal-zone management.

364 The Assembly thanked the Government of Sweden for the secondment of an Associate Expert to the IOC Secretariat for the Sub-Commission and welcomed France's efforts to make an expert available to the IOC Secretariat.

365 The Assembly also thanked Mexico for hosting, during the intersessional period, the Workshops on Recruitment in Tropical Coastal Demersal Communities (TRODERP, Ciudad del Carmen) and on the Analysis of Petroleum Hydrocarbons in Sediments and Biota (Puerto Morelos) and the First Session of the Editorial Board for the International Bathymetric Chart of the Caribbean Sea and Part of the Pacific Ocean off Central America (Aguascalientes).

366 The Assembly also acknowledged with thanks the offer by Venezuela to organize regional activities under the OSNLR Programme and to host the Third Session of the Sub-Commission in Caracas.

367 The Assembly also acknowledged with thanks the offer by Colombia to host a regional training course on oceanographic data exchange.

368 The Assembly adopted Resolution XIV-10.

7.2 THE REGIONAL COMMITTEE FOR THE WESTERN PACIFIC (WESTPAC)

369 The IOC Senior Assistant Secretary, Mr. Ray C. Griffiths, introduced this subject. He briefly reviewed a statement prepared by the Chairman of the Regional Committee for WESTPAC, Dr. John S. Bunt.

370 The Regional Committee for WESTPAC is now in the fourth year of its current intersessional period. By the time of the Thirteenth Session of the Assembly, substantial progress had been made in establishing a number of WESTPAC Task Teams and Study Groups, with wide regional representation.

Some of them have been active, but the need to stimulate progress in some areas was becoming evident.

With this in mind, the Assembly had decided, at its Thirteenth Session, that a symposium on marine science in the western Pacific was a worthwhile immediate objective. The Symposium, entitled Marine Science in the Western Pacific: the Indo-Pacific Convergence, took place in Townsville, Australia, from 1 to 6 December 1986. It was organized by the Department of Science, of Australia, with the support of several other local organizations, notably the Australian Institute of Marine Sciences, the James Cook University (George Fisher School of Tropical Marine Studies) and the Great Barrier Reef Marine Park Authority. France and the USA made generous contributions to the costs of participation of scientists from developing countries of the region, and some Member States covered the costs of participation of their own scientists. The Unesco Division of Marine Sciences and the Regional Office of Science and Technology for South East Asia, as well as the Commission, also supported the participation of a number of scientists from developing countries. 371

Over two hundred individuals from twenty-six countries attended; about 130 papers, augmented by poster displays, were delivered covering the evolution of the arc complex, ocean variability and the links with climate, interannual variability in marine communities, and human influences on the marine environment. The Symposium provided indications of possible future directions in the scientific programmes of the Regional Committee, which will be considered at WESTPAC-IV. 372

The WESTPAC Task Team on Marine Pollution Research and Monitoring in the Western Pacific, under the Chairmanship of Professor Cyril Burdon-Jones, has been encouraging the preparation of directories and salient sources of information in this field. 373

Although regional activities in support of the IOC programme on Ocean Dynamics and Climate have not been developed in the region to the extent anticipated, the direct exchanges between physical oceanographers at the Symposium in Townsville could well alter that situation, through, for example, new opportunities for co-operative research. 374

Concerning Ocean Science in Relation to Living Resources, the Chairman of the Task Team on OSLR in the Western Pacific was unable to complete his term, but one of his colleagues, Dr. Peter Rothlisberg, has assumed this responsibility until the situation is reviewed at WESTPAC-IV. The Task Team is actively moving towards the implementation of at least one major research project on banana prawns, in the context of the International Recruitment Programme. The Task Team's Study Group on Toxic and Anoxic Phenomena Associated with Algal Blooms, under Dr. T. Okaichi, has been equally active. Based on the success of earlier initiatives, Dr. Okaichi, together with Dr. T. Nemoto, is arranging an International Symposium on Red Tides scheduled to be held in Takamatsu, Japan, in November 1987. This initiative also deserves IOC support. Arrangements have also been made to prepare, in co-operation with this Symposium, an IOC Workshop to review on-going or planned activities in various parts of the world on this subject, with a view to establishing a sub-programme of OSLR. 375

376 The IOC Group of Experts on Marine Geology and Geophysics in the Western Pacific held its First Session in Townsville, 4-6 December 1986. It recommended the implementation of two basic projects: Sediments, Environments and Tectonics (SET), as an element of the OSNLR sub-programme on Sediments, Eustatic Sea-level Changes, Tectonics and Resources (SETR) and Margins of Active Plates (MAP), including the study of microplates. It is organizing a Field Study Workshop on SET and has approached the Geological Survey of Papua New Guinea to hold the Workshop there in August 1988 to provide field training and experience on the triple-plate junction in that region.

377 The Chairman of the WESTPAC IGOSS Task Team on the Implementation of IGOSS in the Western Pacific, Commander Ian Bofinger, is devoting considerable energy to IGOSS and, in particular, to ensuring the full participation of national representatives in this important aspect of WESTPAC responsibilities.

378 The Fourth Session of the IOC Regional Committee for WESTPAC is scheduled to be held in Thailand, in June 1987. Australia has already indicated that it is ready to assist in the preparation of documentation. The Chairmen of all Task Teams have been requested to give early attention to the preparation of progress reports for consideration by the Regional Committee.

379 In the opinion of the Chairman of the Regional Committee, WESTPAC is now at a turning point: if it is to continue successfully, it must be able to demonstrate tangible performance in the implementation of collaborative research projects of regional significance; this will be possible only if a few carefully selected topics are identified and if the Member States and their scientific communities are willing to support them directly and through the IOC. Whether or not the Regional Committee for WESTPAC should become a Sub-Commission, will be discussed at the Fourth Session.

380 In his message to the Assembly, the Chairman of the Regional Committee gave his thanks for the encouragement he had received during his term of office, and expressed his appreciation to the Secretary of IOC and his colleagues for their assistance and, particularly, the Government of Australia for its considerable commitment to his involvement in the affairs of the Commission.

381 Several Delegations (notably, Indonesia, Democratic People's Republic of Korea, The Netherlands and Vietnam) informed the Assembly of their countries' intention to participate more actively in the work of the Regional Committee than in the past. Some Delegates indicated their satisfaction with the role the Regional Committee has played in stimulating marine scientific research in the region, and welcomed the possible creation of a Sub-Commission for the Western Pacific hoping that this may help to increase the participation and commitments of Member States and the necessary support, including staff for its effective work.

382 The Delegate of the USA emphasized, however, that any consideration of a Sub-Commission should be closely tied to availability of staff.

Numerous Delegates expressed their satisfaction with the Symposium on Marine Science in the Western Pacific: the Indo-Pacific Convergence and many Delegates expressed a keen interest in obtaining the reports of scientific symposia that have been or are being organized in the region (notably the WESTPAC Symposium itself, the Dutch-Indonesian Symposium on the Snellius-II Expedition, the Workshop on Coastal and Nearshore Processes, the Symposium on Red Tide Phenomena and the Sixteenth Pacific Science Congress). *383*

Several Delegates believed that the Symposium provided an excellent scientific basis on which to build the Regional Committee's future scientific programme. *384*

The Delegates of Australia and the USA emphasized that WESTPAC had reached a significant point in its development. It must now focus on specific scientific projects of interest and demonstrable benefit to Member States of the region. *385*

The Delegate of the United Kingdom informed the Assembly that his country is planning a major oceanographic expedition by the RRS CHARLES DARWIN to the WESTPAC region starting in 1988. It is expected that she will operate a GLORIA sea-bed mapping system. Participation of scientists from the region will be welcomed. *386*

The Delegate of Japan described several of his country's activities in support of WESTPAC (notably the role of the JODC as the RNODC for WESTPAC, the International Symposium on Red Tides - Biology, Environmental Science and Toxicology, and the shipboard training of scientists from the region). He announced his country's intention to continue to contribute, subject to parliamentary approval, $30 000 to the Unesco Trust Fund for WESTPAC activities in 1987, to second an Associate Expert to the IOC Secretariat, and to offer training courses at the Japan Oceanographic Data Centre. *387*

The Assembly welcomed the growing interest of several Member States in increasing their involvement in, and support to, the activities of the Regional Committee. *388*

The Assembly noted the steady progress in regional co-operation in the framework of, or stimulated by, the Regional Committee, and recognized the timeliness of considering the possibility of upgrading it to a Sub-Commission. It urged the Regional Committee, at its Fourth Session, to study this option carefully, to determine the means required for the effective work of the Sub-Commission, as well as possible sources of support by Member States, including contributions to the IOC Trust Fund and the secondment of staff. *389* ▲

The Assembly called on the Regional Committee, when considering its programmes and priorities, at its Fourth Session, to consider the importance of carefully selecting a few topics for collaborative research of regional significance and to take into account sub-regional projects of specific interest to south-east Asia, to the Pacific island States, and to those countries particularly interested in studying the Kuroshio system. *390* ▲

The Assembly instructed the Secretary, when carrying out the study on joint IOC-UNEP regional bodies (see Section 8.3, below), to analyse *391* ▲

present and eventual IOC mechanisms for regional/sub-regional co-operation in marine pollution research and monitoring in the WESTPAC region.

392 The Assembly particularly thanked the following Member States for their specific contributions to the Regional Committee: Japan for its substantial contribution to WESTPAC, to TEMA and IODE activities; the United Kingdom for the offer of shipboard training on board the RRS CHARLES DARWIN; to Thailand for having offered to host the Fourth Session of the Programme Group; and to Australia for having organized the Symposium in Townsville.

7.3 PROGRAMME GROUP FOR THE CENTRAL EASTERN ATLANTIC (IOCEA)

393 The Chairman of the Regional Committee for the Central Eastern Atlantic (IOCEA), Dr. Sekou Konate, introduced this subject. He informed the Assembly of the main outcomes of the Regional Committee's First Session. To advance the regional component of Ocean Science in Relation to Living Resources, the Regional Committee recommended that the Assembly create a Group of Experts on OSLR in the Central Eastern Atlantic. The Regional Committee endorsed the development of SARP and TRODERP at the regional and/or sub-regional levels, and requested the Division of Marine Sciences of Unesco to collaborate with IOC to meet specific training requirements.

394 Regarding Ocean Science in Relation to Non-Living Resources, the Regional Committee adopted pilot projects on Coastal Erosion in the Bight of Benin, on the Effects of Damming Rivers on the Supply of Sediment to the Coastal Zone, and on the Relationship Between Upwelling and Phosphorite Deposits. It recommended that the Assembly create a Group of Experts on OSNLR in the Central Eastern Atlantic to oversee the planning and promotion of these pilot projects.

395 The Regional Committee recommended the convening of a meeting of regional experts to study the feasibility of preparing an International Bathymetric Chart of the Central Eastern Atlantic (IBCEA), with a view to the formation of an Editorial Board for IBCEA, if the conditions for such a project were found to be met.

396 To assess marine pollution problems in the coastal zone, the Regional Committee stressed the importance of developing analytical capabilities in the Member States of the region, with the guidance of the Scientific Committee for GIPME.

397 The Regional Committee recommended that the IOC review the concept, purposes and functioning of IOC Depository Centres so as to enable them to fulfil their principal purposes to inform their respective national marine scientific communities of the availability of IOC publications, as well as those of the UN organizations members of ICSPRO, and to make them available to these scientists. It called on the Unesco Division of Marine Sciences to collaborate with the IOC in assisting the countries of western Africa in developing their marine information capabilities.

398 The Regional Committee decided to implement an IOCEA regional component of GLOSS. To do this it created a Task Team on the Implementation of an IOCEA Regional Component of the Global Sea-level Observing System.

The Representative of Unesco indicated that Unesco activities in the region were contributing to the objectives of IOCEA, such as the Unesco Training Course on Marine Geology just completed in Conakry, Guinea, and the COMAR Regional Project on Coastal Marine Systems in Africa for which UNDP has approved funding. 399

Several Delegates expressed their satisfaction with the outcome of the First Session of the Regional Committee. They saw it as a vital step towards increasing the participation of developing countries in co-operative marine science and the related ocean services, in the region. However, they stressed the need for a strong TEMA component, including support from the Commission's Member States through the Voluntary Co-operation Programme, in the implementation of the proposed programmes. 400

The Delegate of Brazil informed the Assembly that his country had sent a Delegation to the First Session with the determination to co-operate effectively with the States of the region in scientific research, ocean services and TEMA activities. Brazil shares with those countries the awareness that led to the conception of a zone of peace and co-operation in the South Atlantic adopted as a formal Declaration by the 41st Session of the UN General Assembly. The Delegate explained that, in his view, the Regional Committee should not assume excessive responsibilities of a highly technical nature, but rather concentrate its efforts on activities that meet the real interests of the region. In that spirit, his country's Delegation to IOCEA-I had offered a wide range of training opportunities to Member States of IOCEA. 401

Two Delegates (Spain and the USSR) regretted that their countries had not been able to send Delegations to Praia because of lack of timely flights, but expressed their intention to participate actively in the Committee's work. 402

The Assembly agreed that the fruitful First Session of the IOC Regional Committee for the Central Eastern Atlantic marked a major step forward in international co-operation in the marine sciences and the related ocean services in this region. It endorsed the Summary Report and Recommendations of the Regional Committee's First Session, and noted the establishment by the Regional Committee of a Task Team on the IOCEA Component of the Global Sea-level Observing System. 403

The Assembly decided to establish an IOCEA Group of Experts on Ocean Science in Relation to Living Resources in the Central Eastern Atlantic, and an IOCEA Group of Experts on Ocean Science in Relation to Non-Living Resources in the Central Eastern Atlantic. 404

The Assembly adopted Resolution XIV-11. 405

7.4 JOINT IOC-WMO-CPPS WORKING GROUP ON THE INVESTIGATIONS OF EL NIÑO

The IOC Senior Assistant Secretary, Dr. F. Robles, introduced this subject on behalf of the Chairman of the Joint IOC-WMO-CPPS Working Group on the Investigations of El Niño, who was unable to attend. He recalled that, in the framework of the standing agreement between IOC and CPPS, the intersessional activities of the Joint Working Group have concentrated on 406 the regional implementation of two main programmes of IOC that are relevant to El Niño investigations: Ocean Processes and Climate (OPC); and Ocean Science in Relation to Living Resources (OSLR). Several scientists from the south-eastern Pacific region have been trained through courses organized or supported by IOC to strengthen regional participation in IGOSS, the GLOSS system and in El Niño climatological analysis.

407 IOC has continued to provide support for the bilingual (Spanish/English) publication of the ERFEN Bulletin edited by the CPPS and now at N° 20. Funds are also being sought to support, commencing in 1987, the ERFEN monthly Climatic Analysis Bulletin first published by CPPS in June 1986, as a joint venture with IOC.

408 The UNDP-IOC-CPPS Regional Project on Monitoring and Prediction of the El Niño Phenomenon in the South-east Pacific: Application to Development has been given approval by the UNDP for its Fourth Cycle funding programme (1987-1991). UNDP preparatory assistance was also approved to enable the present project document to be up-dated and finalized in the light of the Recommendations of the AGU-IOC-WMO-CPPS International Symposium on El Niño, held in Guayaquil, Ecuador, 27-31 October 1986, which was attended by 130 scientists from around the world. Substantive support for these scientists was provided through AGU and IOC as well as through WMO and CPPS.

409 The main OSLR activities related to the biological components of the El Nino investigations, particularly the Sardine-Anchovy Recruitment Project (SARP) were considered under Agenda Item 5.1.

410 The Representative of CPPS called the attention of the Assembly to the present warm episode that is developing in the equatorial and south-east Pacific regions and to the significant efforts of CPPS member countries to monitor the phenomenon through the ERFEN Programme.

411 Several Delegates expressed their satisfaction with the continuous and successful development of international efforts in the El Niño investigations; they pointed out that this is an example of inter-agency, multilateral, as well as bilateral, co-operation.

412 The Delegate of Chile informed the Assembly of his country's work in the study of the El Niño phenomenon, and of its wish to host the Sixth Session of the Joint IOC-WMO-CPPS Working Group on the Investigation of El Niño, in the second half of 1988.

413 The Assembly endorsed the Summary Report of the Fifth Session of the Joint Working Group and restated the importance of the El Niño investigations in terms of the global oceanic components of the World Climate Research Programme.

414 The Assembly expressed its satisfaction with the approval by UNDP of the IOC-CPPS Regional Project on Monitoring and Prediction of the El Niño Phenomenon in the South-east Pacific: Application to Development, and noted that this initial funding could serve as a catalyst for the mobilization of extrabudgetary funding from donor agencies and other sources of funds to cover components of some other activities identified but not included in the approved UNDP financing.

The Assembly thanked Ecuador for the excellent local facilities provided for both the AGU-IOC-WMO-CPPS International Symposium on El Niño and the Fifth Session of the Joint Working Group. It also acknowledged with thanks Chile's offer to host the Sixth Session of this Group. 415

The Assembly welcomed the publication of the monthly CPPS Climatic Analysis Bulletin, and congratulated CPPS on it. 416

The Assembly adopted Resolution XIV-12. 417

7.5 JOINT CCOP(SOPAC)-IOC WORKING GROUP ON SOUTH PACIFIC TECTONICS AND RESOURCES (STAR) AND THE JOINT CCOP-IOC WORKING GROUP ON POST-IDOE STUDIES OF EAST ASIAN TECTONICS AND RESOURCES (SEATAR)

The IOC Assistant Secretary, Dr K. Kitazawa, introduced this subject. He briefly reviewed the Summary Report of the Twelfth Session of SEATAR (Singapore, 22-23 August 1986). Under SEATAR, a series of Transect Studies have been carried out during the last ten years; most of these Transects are nearing completion, although certain Transects have not yet reached an adequate level of data compilation, owing to communication difficulties amongst the participating countries. However, for most of the Transects, the data collection and analysis have been nearly completed, but no Transect Study is yet totally ready for publication. Some results were displayed at the poster session of the Circum-Pacific Energy Conference held in Singapore. SEATAR addressed the problem of funding the publication of the Transects. For this purpose SEATAR recommended the appointment of a full-time Transect Co-ordinator to complete the Transect Studies and the relevant syntheses for publication. SEATAR recommended to its co-sponsors that it should continue after completion of the current Transect Studies, and it discussed the various possible projects that it could undertake in the future. 418

The Assistant Secretary then reviewed the Summary Report of the Third Session of STAR (Rarotonga, Cook Islands, 2-3 September 1986). STAR activities are carried out by its eight Study Groups. The Age-Dating Study Group is nearing completion of its task, with more than 500 age-data sets for islands and sea-mounts in the south and central Pacific, and is now seeking possible means of printing. The Remote Sensing Study Group proposed pilot projects in four areas in the South Pacific region as a demonstration of the application of satellite imaging to coastal zone management. As a follow-up to the successful CCOP(SOPAC)-IOC Workshop on the Use of Submersibles and Remotely Operated Vehicles in the South Pacific (Suva, Fiji, 24-29 September 1985), the STAR Group established a Study Group on the Use of Submersibles and Remotely Operated Vehicles and asked the Study Group to draft guidelines for the survey of diving sites. This STAR Study Group proposed the organization of two Workshops: one on coastal processes and non-living resources, to be held in September 1987 to provide scientific and technical information and background to Member States that are currently facing serious problems in dealing with coastal protection; the other is the Third International Workshop on Geology, Geophysics and Mineral Resources in the South Pacific, to be held possibly in 1988/1989, to review the current progress in this field of science and to draw up an eventual 419 research plan for the region. IOC was requested to co-sponsor these Workshops.

420 Two Delegates (Australia and Japan) stated that IOC, when considering regional projects in the WESTPAC region, should keep in mind on-going or future SEATAR projects, so as to avoid duplication of efforts; these Delegates welcomed IOC's co-operation with the CCOP.

421 The Delegate of Japan expressed his view that the IOC, and particularly its OSNLR component of the WESTPAC Programme, should focus on science rather than on its applications; he also expressed his concern over any increase in the IOC budget due to SEATAR activities, beyond what has already been approved. He felt that IOC's main connection with SEATAR should be through OSNLR.

422 The Delegate of the Federal Republic of Germany stated that his country wished to continue to assist SEATAR studies, and that scientists from the region will be invited to participate in a training course on the R.V. SONNE in the South China Sea and the Sulu Sea, in April-July 1987.

423 ◗ The Assembly accepted the Summary Report of the Twelfth Session of SEATAR and expressed its appreciation of the results of various activities carried out by SEATAR.

424 ▲ The Assembly encouraged SEATAR to continue to develop its studies and advise the Commission on technical matters within its spheres of competence.

425 ▲ The Assembly instructed the Secretary to develop relevant co-operative scientific and technical programmes with CCOP particularly in the framework of the future programme of SEATAR.

426 The Delegates of Japan and Australia expressed similar concern over STAR to those they expressed on SEATAR. However, the Delegate of Australia expressed his satisfaction with the joint efforts made with CCOP(SOPAC), and his country's support for the proposed Workshop on Coastal Processes and Non-Living Resources.

427 ▲ The Assembly accepted the Summary Report of the Third Session of STAR and noted the positive work of the Joint Working Group. It encouraged STAR to continue its work in the same spirit as hitherto shown.

428 ▲ The Assembly instructed the Secretary to develop relevant co-operative scientific programmes with CCOP(SOPAC), within the approved budget base for 1988-89.

429 ◗ The Assembly decided to co-sponsor with CCOP(SOPAC) the Workshop on Coastal Processes and Non-Living Resources.

8. CO-OPERATION WITH OTHER ORGANIZATIONS OF THE UN SYSTEM AND OTHER BODIES

8.1 TWENTY-FIFTH SESSION OF THE INTER-SECRETARIAT COMMITTEE ON SCIENTIFIC PROGRAMMES RELATING TO OCEANOGRAPHY (ICSPRO)

The Chairman introduced this subject. He gave his appraisal of the Twenty-fifth Session of ICSPRO. He noted that the Commission, because of its special nature as a forum for consultation and co-ordination, offers a unique possibility within the UN System for strengthening the links between the Organizations participating in ICSPRO. Among the Agenda Items of the ICSPRO Session, he emphasized the importance of those on Marine Information Management, the Joint Oceanographic Assembly and Formulation of Medium-Term Plans and Biennial Budgets. 430

Marine Information Management is viewed as a basic tool for strengthening communication and as a mechanism for co-ordination. Further refinement of certain registers, such as meetings and distribution lists was considered as essential to optimizing the provision of information on subjects of common interest and to assist the Member Organizations and IOC in planning their work. The Committee emphasized the importance of the IMS Newsletter as a common information vehicle and made suggestions on ways in which this function could be further improved. The Committee had also expressed its interest in the IOC plan to develop a strategy for marine information management and wished to be closely associated with this endeavour. 431

Regarding the Joint Oceanographic Assembly, the Chairman reported that the Committee had agreed to establish the JOA Logistics Committee and, through that forum, hopes to be able to participate actively in the preparation and organization of JOA. He referred to the funding that IOC had already been able to identify in the 1988-1989 budget in support of the Joint Oceanographic Assembly. 432

Consideration of programme and budget documents and the planning thereof led to an updating of tabulated material which indicates the major spheres of common interest. This is a good example of the positive role played by ICSPRO in strengthening collaboration within the UN System on marine science and related aspects. 433

The Chairman expressed his appreciation to the Member Organizations for their understanding of the delays in moving forward with the formulation of the second phase of the Long-term and Expanded Programme of Oceanic Exploration and Research (LEPOR). He also drew the Assembly's attention to the view of the Committee that there was "need for a short-term consultancy to provide the required staff support" so as to ensure completion of the project in time for submission in 1989 to the IOC Assembly, ECOSOC and the UN General Assembly. 434

The Assembly welcomed the interest expressed by the Committee to be closely associated with the plan to develop a marine information strategy. 435

The Assembly recognized that, just as the efforts of States in attaining their national goals are enhanced through co-operation and joint 436 action, the collaborative arrangements among the Member Organizations of ICSPRO strengthen the work of all of them. It took the view that IOC Member States look to ICSPRO not only as the body through which IOC acts as a joint specialized mechanism, but also as a forum for co-operation and co-ordination that welds together the many facets of marine-related programmes of the United Nations participating Organizations.

8.1.1 Second Phase of the Long-term and Expanded Programme of Oceanic Exploration and Research (LEPOR-II)

437 Some Delegates requested clarification of the proposed arrangements and calendar for the preparation of LEPOR-II.

438 The Secretary informed the Assembly that, in view of the shortage of staff and budget, the calendar for the preparation of the Second Phase of LEPOR had been put back by one year relative to the calendar agreed at the Nineteenth Session of the Executive Council.

439 The Delegate of the USSR expressed his concern over the fact that the consideration of LEPOR-II had been deleted from the Agenda; the proposed consideration of this matter at ICSPRO-XXVI only in 1988 could significantly delay preparation of the programme.

440 The Assembly noted the new proposed calendar for the preparation and submission of the final draft of LEPOR-II to its Fifteenth Session.

8.1.2 Joint Oceanographic Assembly - 1988

441 The President of SCOR, Professor Gerold Siedler, introduced this subject. He informed the IOC Assembly of the actions which had been taken with regard to JOA since the Nineteenth Session of the IOC Executive Council in March 1986. In July, SCOR received and accepted a formal invitation from the Consejo Nacional de Ciencia y Tecnologia de Mèxico which is the parent body of the Mexican Committee for SCOR. In accordance with the decision of its Seventeenth General Meeting, SCOR has established an international Scientific Programme Committee under the Chairmanship of Professor Warren Wooster. A National Organizing Committee has been formed and is being chaired by Dr. Ayala-Castañares.

442 The President of SCOR noted that JOA is the major interdisciplinary congress in marine science and that it is only held every six years. He hoped that the convening of JOA in Mexico will provide an excellent opportunity for greater participation of developing country scientists than has hitherto been possible. He referred to the Second Circular on JOA which had been prepared by the Chairman of the Mexico National Organizing Committee and had been distributed to the participants in the IOC Assembly. It included information on sponsoring organizations, although this list is still incomplete, and provides information on the structure and general content of the Scientific Programme which includes interdisciplinary General Symposia, cross-disciplinary Special Symposia and more specialized Association Sessions. A detailed call for papers will be issued by the Scientific Programme Committee in mid-1987. Prof. Siedler especially mentioned ICES' interest in co-sponsoring JOA.

443 The Executive Secretary of SCOR, Mrs. Elizabeth Tidmarsh, expressed the hope that the IOC Assembly and the Member States would vigorously support these plans for JOA-88. In particular, she urged them to consider ways in which they might facilitate the attendance of: (i) speakers and conveners; (ii) other participants, possibly through national programmes of travel grants as was done by some countries for JOA-82 in Halifax; and (iii) speakers, conveners and participants from developing countries, either through existing assistance agreements or through new ones developed for this purpose. She noted that ICSPRO has recommended the establishment of a JOA Logistics Committee which will mobilize support for the JOA amongst the ICSPRO agencies. In view of the likely financial constraints upon these agencies and of the increased needs of many JOA participants for travel funds, SCOR wished to appeal to the IOC Member States to provide this additional assistance to the international scientific community.

444 The Representative of Unesco drew attention to the interdisciplinary nature of the Joint Oceanographic Assembly which contrasts with the more frequent unidisciplinary meetings. Therefore, JOA is able to integrate recent advances across the entire spectrum of ocean research, including the impact of that research on society. Unesco has supported these conferences since the beginning, in 1959, together with the IOC after its formation, because of the need to bring together scientists from a wide range of disciplines so as to stimulate oceanographic research in all countries. Unesco and the IOC will again substantially support the 1988 Joint Oceanographic Assembly, provided the Unesco Member States support this proposal in the Draft Programme and Budget for 1988-1989 at the Unesco General Conference in October/November 1987.

445 The Representative of ICES confirmed the intention of his organization to sponsor JOA.

446 The Chairman of the National Organizing Committee, Dr. Agustin Ayala-Castañares, referred to the arrangements being made by that body to ensure the success of JOA. He emphasized the need for Member States to support these efforts, by publicizing it within their marine scientific communities and by providing travel grant support. Since this will be the first JOA to take place in a developing country, he hoped that it would be given particular attention by the Member States.

447 The Assembly welcomed this information; it noted that the Logistics Committee had been established under the Chairmanship of the Secretary of ICSPRO.

448 The Assembly adopted Resolution XIV-13.

8.2 ENHANCING CO-OPERATION BETWEEN THE IOC AND THE UNESCO DIVISION OF MARINE SCIENCES

449 The Chairman of the Study Group on Measures to Strengthen the Co-ordination of the Programme Activities of Unesco's Division of Marine Sciences and the IOC, Professor Ulf Lie, introduced this subject. He drew attention to Resolution EC-XIX.11 and the task assigned to the Study Group,

which had been carried out in close co-operation with the Secretariats of the IOC and of the Unesco Division of Marine Sciences.

450 Summarizing the main features of the Study Group's Report, Professor Lie informed the Assembly that the Study Group was of the view that the Unesco-IOC Comprehensive Plan for a Major Assistance Programme to Enhance the Marine Science Capabilities of the Developing Countries constitutes a major link between the assistance programmes of the IOC and of the Division of Marine Sciences, and, therefore, its implementation requires mobilization of the marine science competence of Unesco as a whole. Since the implementation of the Plan requires the development of strategies, and the progress in its implementation needs to be reviewed periodically, the Technical Committee for TEMA could undertake that task and provide guidance to IOC and Unesco on these matters.

451 The Study Group therefore recommended that the sessions of the Technical Committee for TEMA be serviced jointly by the IOC and Unesco Secretariats, through, inter alia, joint planning of the Agenda and other preparations for the Technical Committee's Sessions, and co-operation in the implementation of the Committee's recommendations.

452 Pursuant to Resolution EC-XIX.11, the Study Group also analysed the functioning of the Technical Committee for TEMA, the original Terms of Reference of which were very broad. The Study Group recommended that, in the future, the Technical Committee concentrate more on the policy aspects of the formulation and execution of the training, education and mutual assistance activities of general interest to the Member States. With this in mind, the Study Group proposed new Terms of Reference for the Committee (Document IOC-XIV/11, Annex I).

453 The Chairman of the Study Group concluded that joint servicing of the Technical Committee for TEMA by the IOC Secretariat and the Division of Marine Sciences would be an important step towards serving better the Member States in the field of training and education as well as promoting mutual assistance amongst them. On behalf of the members of the Study Group, he expressed their appreciation to the Secretary IOC and the Director of the Division of Marine Sciences for their collaboration.

454 A number of Delegates welcomed the valuable work of the Study Group and the suggestion that the sessions of the Technical Committee for TEMA should, in the future, be jointly serviced by the Secretariats of the IOC and the Division of Marine Sciences. Various Delegates recalled that TEMA is one of the most important activities of the Commission, particularly in the context of the on-going programmes, not only of the Commission but also of the Division of Marine Sciences, which plays a leading role in developing marine science in universities and other institutions, as well as developing marine science infrastructure. The co-operative efforts of the Secretariats of IOC and the Division of Marine Sciences would, therefore, be an important step towards meeting the needs of the developing countries, as well as facilitating their effective participation in the on-going programmes of the IOC and of the Division of Marine Sciences.

455 One Delegate emphasized that training and education can greatly contribute to facilitating the transfer of knowledge and technology. Another Delegate described his country's approach to international training

for research which, in his view, should have four phases: joint planning of the research, joint collection of the data, joint processing of the data, and joint publication of the research results.

Some Delegates attached considerable importance to strengthening intergovernmental co-operation to enhance marine science capabilities through mutual assistance amongst the Member States. Although bilateral co-operation may be more suitable for industrialized countries, because of their level of development, this form of co-operation may not necessarily be equally suitable for developing countries where multilateral arrangements offer more appropriate opportunities for the development of the required capabilities for marine research, often within the framework of a commonly agreed scientific programme. This is an area where IOC and its regional subsidiary bodies could play a major role. 456

Some Delegates identified several activities where the complementary role of IOC and the Division of Marine Sciences could be rewarding. These include: publication, at low cost, of text books and manuals and guides in the marine sciences and related fields; training and education in selected fields, including certain aspects of new marine technology applicable to ocean-observing systems, and the management of marine scientific research programmes; establishment of institutional links so as to foster national and regional capacities for ocean research in support of development; and improved use of research vessels. 457

The Delegate of the Ukrainian SSR reported that a research vessel of the Ukrainian Academy of Sciences had been placed at the disposal of the Unesco Training Course in Marine Geology being held in Conakry, Guinea. 458

The Delegate of the Federal Republic of Germany informed the Assembly that his country was making the R.V. METEOR available to an IOC-FRG Regional Training Course in Coastal Bathymetry to be held in Madagascar in 1987, and would also offer further IOC Research Fellowships in 1987. 459

The Delegate of the USSR reported on a co-operative research cruise which also involves a training component on board USSR Research Vessel GEORGI USHAKOV in the Mozambique Channel area in July/August of 1987, in support of IOCINCWIO. 460

The Delegate of China informed the Assembly of his Government's intention to offer four fellowships in 1988/1989 under the IOC Research Fellowship Scheme (IOC-RFS), particularly in the fields of marine biology, marine chemistry, marine geology and oceanographic instrumentation. 461

The Delegate of Denmark, placing emphasis on training of senior technicians, said that Denmark and other Nordic countries would consider the possibility of contributing fellowships under the IOC-RFS. 462

Several Delegates drew the attention of the Assembly to some factors that seem to affect present international co-operation in the marine sciences. 463

In particular, the Delegate of the Federal Republic of Germany noted that, in recent years, the consent regime applied to marine scientific research has made the planning of research cruises less simple 464 than in the past. Member States withhold their permission to research vessels from foreign institutions to carry out studies in their respective Exclusive Economic Zones, even when these cruises have been officially announced by the IOC (as in the case of the RV METEOR in the contexts of IOCINCWIO and IOCINDIO). They also prevent such vessels from entering ports of call for the purpose of changing crews, transferring equipment and victualling. This means that the possibilities for co-operation amongst States, including training and transfer of relevant technology to scientists of the developing countries, are decreasing.

465 Delegates stressed that, since many of the regional and global programmes of the Commission require concerted action by States, the IOC should endeavour to assist Member States to co-operate in this domain, through, for example, the formulation of a code of practice for marine scientific research in Exclusive Economic Zones.

466 The Chairman thanked the Study Group for the completion of its work.

467 The Assembly adopted Resolution XIV-14.

8.3 CO-OPERATION BETWEEN IOC AND UNEP IN MARINE POLLUTION RESEARCH AND MONITORING

468 The IOC Senior Assistant Secretary in charge of Marine Pollution Research and Monitoring, Dr. Gunnar Kullenberg, introduced this subject. He referred particularly to the Aide-Mémoire of January 1984 and the considerable strengthening of co-operation between IOC and UNEP which had occurred since then, and to the Summary Report of the Sixth Session of the Scientific Committee for GIPME (Document WC-GIPME-VI/3).

469 The Senior Assistant Secretary also presented the main points of a new Aide-Mémoire that is under negotiation, including agreements on further strengthening of co-operation and co-ordination between IOC and UNEP through joint sponsorship of the GIPME Groups of Experts, joint projects and programmes on global and regional scales, and support from UNEP for an expert staff member of IOC to be outposted to the Regional Co-ordinating Unit for the Caribbean Action Plan and to work closely with the IOC Senior Assistant Secretary for IOCARIBE. The Aide-Mémoire under negotiation thus emphasizes further the positive spirit of co-operation between IOC and UNEP.

470 The Representative of UNEP referred to further broadening of co-operation between IOC and UNEP since the last Session of the Assembly, on subjects of mutual interest to both organizations and to their constituencies. These subjects include a number of regional projects, notably in the Caribbean, the Mediterranean and the western and central African region; co-sponsorship of GEMSI, GEEP and GESREM; and co-operation on the preparation of nine regional overviews of the state of the marine environment, as an input into a global overview being prepared by UNEP through GESAMP.

471 The co-operation between IOC and UNEP is further intended to cover the launching of a global "mussel watch", initially to determine the levels of organochlorines in suitable marine sentinel organisms and the

preparation of several regional reviews of potential ecological and socio-economic effects of expected climatic changes and concomitant sea-level and temperature elevations.

472 UNEP, as support to the regional Conventions and Action Plans adopted in nine regions in the framework of the UNEP Regions Seas Programme, is negotiating the establishment of scientific/technical expert advisory bodies to these Conventions and Action Plans. In addition to their advisory role, at least some of these bodies will be entrusted with the task of assisting with the implementation of projects assigned to them by the Contracting Parties to the regional Conventions. In order to avoid duplication of work and of organizational structures, the Representative of UNEP invited the Assembly to consider the possibility of IOC's co-sponsoring with UNEP, if appropriate, the regional expert bodies being created under the Regional Seas Programme.

473 The Assembly expressed its great satisfaction with the way in which co-operation between IOC and UNEP has developed during the last few years, on the global level through the GIPME Groups of Experts, and, in relation to global evaluations such as that of the State of Health of the Oceans undertaken within, for example, the framework of GESAMP, and on the regional level through a series of joint activities. It endorsed the spirit and general content of the Aide-Memoire of March 1987 on the on-going consultations between IOC and UNEP.

474 The Assembly expressed a strong interest in UNEP becoming a Member of ICSPRO.

475 The Assembly instructed the Secretary to pursue negotiations with UNEP on furthering co-operation between the two organizations, at the global and the regional levels, with a view to eventual co-sponsorship of the Scientific Committee for GIPME and of the MARPOLMON system.

476 The Assembly welcomed the co-operative interaction between regional subsidiary bodies of IOC and of UNEP related to the Regional Seas Programme, through the development of joint projects and other joint activities, such as training workshops; it emphasized the need to further strengthen co-operation and co-ordination at the regional level so as to link the activities of IOC and UNEP, which would be of particular benefit to the Member States of the respective regions and their national institutions. Representation at the meetings of the regional bodies and of expert groups by Officers from, or experts familiar with, the relevant programmes would thus be desirable.

477 The Assembly noted the possibility of providing results from IOC programmes, besides GIPME, and ocean services such as GLOSS and IGOSS, to UNEP activities, and encouraged the full exploration of these possibilities.

478 The Assembly took note of the invitation from the Representative of UNEP that scientific and technical expert advisory bodies to the Conventions and Action Plans adopted within the framework of the Regional Seas Programme of UNEP, the establishment of which is being negotiated, be jointly sponsored by IOC and UNEP, so as to avoid duplication of work and organizational structures. It noted however that there may be problems in the creation of such joint bodies; e.g., the difference in geographical

coverage between the IOC and the Regional Conventions and Action Plans. However, it stressed that the situation should be studied with a view to finding a satisfactory solution to such problems.

479 The Assembly considered it important to study carefully the implications for the IOC regional subsidiary bodies and Member States of any proposal to establish joint groups of experts or merge existing regional intergovernmental organizations. It therefore instructed the Secretary to prepare a study, preferably in co-operation with the UNEP Secretariat, taking into account views and advice of Officers of relevant existing regional subsidiary bodies, and circulate the result of the study in good time before the Twenty-first Session of the Executive Council of IOC, so that it could be thoroughly considered thereat.

480 The Assembly invited UNEP to participate in the preparation of the aforementioned study.

481 The Assembly adopted Resolution XIV-15.

9. MEDIUM-TERM PLAN, PROGRAMME AND BUDGET

9.1 IOC CONTRIBUTION TO THE UNESCO MEDIUM-TERM PLAN FOR 1990-95

482 The Secretary introduced the subject. He referred particularly to a Draft Proposal (Document IOC-XIV/8 Annex 4) on the IOC contribution to the Unesco Draft Medium-Term Plan, explaining that the text is considered as a framework within which the major thrusts of the Commission's future programme may be identified. He noted that the final version to be submitted to Unesco would be limited to about two pages, and that the present text would eventually have to be distilled to the essence of the message the IOC wishes to convey. On the other hand, he felt that an expanded version of the Proposal could be useful in reformulating and updating the Long-term and Expanded Programme of Oceanic Exploration and Research (LEPOR).

483 Attention was drawn to the anticipated time-frame within which Unesco would develop the Medium-Term Plan and to a questionnaire that the Director-General had sent to Unesco Member States and international governmental and non-governmental organizations. The latter, to which a response is requested by January 1988, is intended to solicit a breadth of views on the content of the future programme and related methodological arrangements. This schedule should allow for a timely review of the marine component of the Plan by the IOC Executive Council at its Twenty-first Session.

484 Regarding the present thrusts of the programme developed by the Secretariat in consultation with the Officers of the Commission and of its subsidiary bodies, the Secretary noted that the expected increase in the penetration of human society into the ocean might well call for gradual reorientation of the science programmes and service activities of the Commission. Examples of this could be seen in an acceleration in the use of an interdisciplinary approach to implementation within and between the various scientific components of the programme, as well as a close interface

within global and regional ocean observing systems. The continued growth of these programmes and their implementation at the regional level would depend upon the success with which the necessary resources can be mobilized and upon the reinforcement of national capacities within the Unesco-IOC Comprehensive Plan for a Major Assistance Programme.

Several Delegates expressed the view that the marine component of the Third Medium-Term Plan of Unesco would provide general guidance, but that the direction to be taken was not yet totally clear. Decisions on the breadth of IOC endeavours needed to take into account the requirement of adequate and dependable resources, as well as priority areas of action. 485

Many Delegates offered specific suggestions for additions and adjustments to the major thrusts and goals of the IOC during the coming years: 486

(i) ocean science in relation to living resources should be given a higher priority in view of its relevance to socio-economic development;

(ii) ocean services and observational systems, such as GLOSS, including related marine technology and special applications for specific needs should be expanded;

(iii) the development of data exchange and information management, with emphasis on modern techniques applicable at the institutional and national levels and establishment of required networks should be accelerated;

(iv) accent should be placed on regional monitoring networks in the assessment of the health of the oceans;

(v) the ocean component of the World Climate Research Programme should receive intensive support, since the Plan coincides with the major implementation period;

(vi) interaction between ocean sciences and engineering, including increased involvement in activities aimed at development and application of new technology to ocean data collection and exchange should be promoted;

(vii) the increased involvement of developing Member States in IOC Programmes through, for example, specific initiatives in training, education and mutual assistance in the marine sciences (TEMA), regional expert consultations and advisory services and assistance under the Unesco-IOC Comprehensive Plan, should be promoted.

The Assembly recognized the value of identifying the future trends in the Commission's programme as a means of demonstrating how IOC activities address issues of concern to mankind as a whole. It stressed the value of public information material, and instructed the Secretary to include reference to the major directions of the IOC Programmes in any biennial reports and information brochures that may be produced. 487 ▲

488 The Assembly requested Member States to submit their suggestions on elements for the marine component of the Unesco Medium-Term Plan to the Secretary no later than 30 June 1987. It also requested the advisory bodies of the Commission to provide their views on this matter by the same date. In view of the need to condense the present text, submissions should not exceed two pages.

489 The Assembly noted the importance of the Director-General's questionnaire on the Medium-Term Plan and emphasized the opportunity being provided to IOC Member States to ensure that the importance of the oceans is appropriately reflected in the Unesco programme for 1990-1995. It requested the IOC Action Addressees in Member States to establish contact with their respective National Commissions for Unesco to that effect.

490 The Assembly instructed the Secretary to present a report to the Twenty-first Session of the Executive Council on progress made in the formulation of the IOC Contribution to the Plan, after having revised the present text to take into account the suggestions made by the Member States and advisory bodies.

491 The Assembly adopted Resolution XIV-16.

9.2 IOC PROGRAMME OF WORK AND BUDGET FOR 1988-89

492 The Secretary introduced this subject. He presented a Proposal on the IOC Programme of Work and Budget (Document IOC-XIV/8 Annex 5). He emphasized the new situation within which the IOC is working, pending clarification of the measures that might be taken to ensure adequate and dependable resources. Developing programme planning documents without a clear indication of resources to be expected from Unesco and through voluntary contributions to the IOC Trust Fund has resulted in the need to prepare two-tiered proposals. The first component is the IOC programme within the Draft Unesco 24 C/5 (Programme X.4) which contains the basic activities essential to maintaining the Commission's Programmes. The second component, indicated by vertical bars in the left margin of the abovementioned Document, contains a series of activities related essentially to global and regional programme implementation that would be carried out as a function of the resources made available through the IOC Trust Fund. Although the level of resources provided through Unesco can be anticipated with a relative degree of certainty, subject to decisions of the General Conference, the success of Member States' efforts to mobilize voluntary contributions to the IOC Trust Fund is less predictable. Fluctuations in the level of resources also depend on possible readjustments in the Unesco budget during a biennium. Therefore, the IOC Programme of Work and Budget for 1988-89 has been developed from two perspectives: (i) ensuring basic activities (Governing and Subsidiary Bodies, expert groups and core funding for programme implementation) through funds provided by Unesco in the Draft 24 C/5; and (ii) defining activities to be implemented through voluntary contributions in order to carry out the IOC Programme as a whole. The Secretary pointed out that the total programme funds so identified ($ 3 250 000) represented a hypothetical ceiling and that the degree to which the entire proposed programme would be carried out would depend upon the funding made available to the Commission during 1988-89. He informed the

Assembly that he had been advised of the intention of the US Government to contribute some $ 500 000 in 1987.

493 The Delegate of the USA confirmed the statement of the Secretary regarding the commitment by her Government to a voluntary contribution to the IOC Trust Fund in 1987, and she informed the Assembly that her Administration's funding proposal for 1988-89 was now before the Congress. Reaffirming the intentions of her Government, she recalled the statements of the US Delegate to the Thirteenth Session of the Assembly and to the Nineteenth Session of the Executive Council concerning her country's intention to continue full and active participation in the IOC and support of the Commission's activities.

494 Several Delegates referred to programmes and activities of particular interest to their countries and regions.

495 ▲ The Assembly instructed the Secretary to take the suggestions of Delegates into account when developing the programme activity details for each annual budget during the biennial period.

496 In response to a suggestion for storm-surge activities, the Representative of WMO informed the Assembly that relevant assistance in infrastructure development and forecasting techniques is provided through a number of projects, largely organized through regional panels, of his Organization. He looked forward to increased collaboration with the Commission in this field.

497 In response to concerns expressed by some Delegates regarding the desirability of ensuring that Regional Subsidiary Bodies meet every two years, the Secretary explained that, under the present budgetary and staff restrictions, emphasis had been given to programme implementation rather than to the convening of meetings.

498 The Delegate of Japan emphasized the importance of both programme implementation and the convening of meetings, whenever necessary, in order to make the work of the IOC more effective.

499 The Delegate of the United Kingdom stated that his country was dissatisfied with the way in which the financial affairs of the Commission have been dealt with during this Session of the Assembly. Firstly, it is not acceptable for the financial documents to become available in English only after the Session has started. If, at the next Assembly, documents cannot be provided well in advance of the session, his Delegation may well feel obliged to reject any Draft Resolution on the Programme and Budget of the Commission. Secondly, as usual at this Session, the Assembly has continued to establish numerous new Groups of Experts which are a very expensive form of subsidiary body for the Commission. The Delegate considered that the Document (IOC-XIV/Inf. 15) on the Financial Implications of Draft Resolutions did not indicate the real costs of these new groups that will fall on the Commission and which cannot be satisfactorily identified at the present time. The Delegate requested the new Chairman and Bureau to give consideration to reconstituting the sessional Financial Committee to meet either for a day or two before the next Session of the Assembly or early in the Session in parallel with other debates.

500 The Delegates of the USA and the USSR also expressed their concern over the delay in the receipt of the Programme and Budget documents since it left insufficient time for analysis prior to the Assembly.

501 The Assembly commended the Secretary on the new format and structure of the programme and budget for its clarity and improved presentation of the links between programmes and TEMA support for implementation purposes.

502 The Assembly recognized that special attention should be given by Unesco and the other UN organizations members of ICSPRO to the staff situation so as to ensure adequate servicing of the programme as a whole and of the Regional Subsidiary Bodies, in particular.

503 The Assembly noted that the Report on the IOC Programme of Work and Financial Requirements would include an overview of the Commission's resources for 1988-1989, reflecting decisions of the General Conference and the state of voluntary contributions so that the Executive Council could adjust planned programme implementations, if required.

504 The Assembly recognized the need to ensure that adequate new resources were available to the Commission. This need represents a challenge to the Commission, both in regard to the efforts of Member States to mobilize voluntary contributions and to the need to define measures to identify budgetary requirements, bearing in mind the requirements for timely and adequate programme implementation.

505 The Assembly adopted Resolution XIV-17.

9.3 PROGRAMME AND BUDGET OF THE UNESCO DIVISION OF MARINE SCIENCES, 1988-89

506 The Representative of Unesco (Director, Division of Marine Sciences, Dr. Dale C. Krause) introduced this subject. He particularly drew the Assembly's attention to Document MARINF/60, which presents the details of co-operation with the Commission for 1986-1987, the programme for 1986 and 1987, the proposed programme for 1988-1989, the extrabudgetary programme for 1987 which is Unesco's contribution to the Unesco-IOC Comprehensive Plan for a Major Assistance Programme, and the evaluation of the Major Interregional Project on Training and Research Leading to the Integrated Management of Coastal Systems (COMAR).

507 He emphasized that the programme is jointly planned and executed by the Division of Marine Sciences and the five Unesco Regional Offices of Science and Technology (ROSTs). The programme and budget for 1988-1989 proposes to concentrate the programme of the Division and the ROSTs in the one Programme X.5 - Training and Research in the Marine Sciences and Their Application to Coastal Management, instead of in two programmes, X.4 and X.5, as at present. He noted the impact on the programme of the withdrawal of three Member States from Unesco, which resulted in a reduction of 30 per cent in Member States' contributions to Unesco.

He informed the Assembly of the untimely death of Dr. Boniface Mwaiseje (Tanzania), marine science specialist in the Regional Office of Science and Technology for Africa in Nairobi. 508

Numerous Delegates thanked Unesco for the assistance that had been provided to their countries through the programme of the Division of Marine Sciences and the Regional Offices of Science and Technology. They further remarked on the high quality of the programme and of the services provided. 509

The Delegate of Indonesia cited several areas of fruitful co-operation: the promotion of the Indonesian-Netherlands Snellius II Expedition and the forthcoming symposium on its results; implementation of the new $800 000 extrabudgetary project on marine pollution; participation in the regional extrabudgetary project on research and training on the mangrove ecosystem; collaboration in the seminar on Man's Impact on the Coastal Environment (partly supported by Japanese Funds-in-Trust). He encouraged linkage with the IOC programme. He also noted that a workshop will be held next year on launching a co-operative programme on ocean engineering and technology. 510

The Delegate of Egypt pointed out the long history of co-operation with the Division in the development of Egyptian marine science, and his hopes for continued co-operation. He noted the forthcoming meeting on oceanographic institutions in the Arab States (Jordan, 3-8 October 1987), which would significantly advance co-operation in the region. 511

The Delegate of India emphasized the usefulness of the programme in providing the scientific foundation for coastal management, which is important for India and the region. He considered that India benefitted from the programme and could also contribute to making it more effective in the region, by inexpensively reproducing manuals and by providing training. He indicated the existence of places on training courses (on aquaculture, for example), provided that fellowships could be made available. 512

The Delegate of Kenya indicated the benefit of the programme to his region. He expressed his sorrow at the loss of Dr. Mwaiseje. 513

The Delegate of Australia found the Document MARINF/60 clear and informative. He appreciated the assistance provided by Unesco for the participation of scientists from his region in the IOC Symposium on Marine Science in the Western Pacific: Indo-Pacific Convergence (Townsville, 1-6 December 1986). 514

The Delegate of China gave high approval to the programme, and suggested that it could be further strengthened. China offered co-operation in using its newly developed experimental facilities for research and training on marine ecosystems. 515

The Delegate of Tunisia thanked Unesco particularly for the assistance that was provided to young marine scientists to carry out research and to present their results at scientific meetings. He hoped that this programme could be expanded. 516

In his summation, the Representative of Unesco thanked the Delegates for their support, in the name of the staff of the Division and 517

Regional Offices, pointing out the significant role of their countries' scientists in the success of the programme. He suggested that the Delegations, having commented on the Programme, may wish to communicate these to their countries' delegations to the Unesco General Conference in October 1987 when they will decide on the Unesco programme and budget for 1988-1989.

518 The Assembly adopted Resolution XIV-18.

10. ENHANCING THE ROLE OF THE COMMISSION

10.1 AMENDMENTS TO THE IOC STATUTES

519 The Chairman invited the Past Chairman, Dr. Ayala-Castañares, who had supervised the in-depth study on the amendments submitted to the Nineteenth Session of the Executive Council, to introduce this subject.

520 Dr. Ayala reminded the Assembly that the question of amendments to the Commission's Statutes had been under consideration for more than a decade, notably through the work of the IOC Working Group on the Future Role and Functions of the Commission, in 1978, the Task Team to Study the Implications, for the Commission, of the UN Conference on the Law of the Sea, and the New Ocean Regime, from 1980 to 1985, and the ad hoc Preparatory Meeting on the In-depth Studies on the Structure, Resources and Role of the IOC, in 1986, immediately prior to the Nineteenth Session of the Executive Council. He recalled that the Executive Council, at its Nineteenth Session, had recommended that the Assembly approve the proposed amendments to Articles 1, 2 (except new sub-paragraph (j)), 3, 4, 5 and 9, given in Annex 1 to Resolution EC-XIX.8, which was adopted by consensus by the Council. The Council had not, however, been able to agree revised texts for Article 2, paragraph 1, new sub-paragraph (j), or for Article 10, paragraph 3. It had therefore urged the Member States concerned to consult among themselves during the intersessional period with a view to arriving at agreed amendments to those two Articles. The Secretary, on the instructions of the Council, sent all proposed amendments, approved by the Council or otherwise, to the Member States and to the UN organizations members of ICSPRO and other international organizations concerned with the work of the Commission, under IOC Circular Letter No. 1082 in June 1986, inviting comments and proposals for amendments. The Legal Adviser of Unesco had, he noted, expressed doubts as to the constitutional acceptability of the proposed amendment to Article 1, paragraph 1. Her comments, together with those submitted by France, the USSR, UN, FAO and IMO, prior to the Fourteenth Session of the Assembly were before the Assembly in Documents IOC-XIV/8 Annex 6 Add. and 6 Add. 2.

521 The Representative of IMO, referring to the amendment to Article 3, paragraph 2, reiterated the concern of that Organization in respect of the last part of the proposed amendment to Article 3, paragraph 2 of the IOC Statutes which implies that organizations of the UN System would sustain the work of the Commission in discharging its various responsibilities. Such an idea would be a departure from the current basis on which organizations in the UN System participate in ICSPRO and should not be introduced. The support or sustenance that can be provided to IOC under the ICSPRO Agreement will continue to be subject to consideration of the prevailing circumstances

at any one time and, as such, should not be made an obligation under the IOC Statutes. It is sufficient that the ICSPRO Agreement itself does reflect the commitment of ICSPRO participants in this regard.

Numerous Delegates made preliminary statements stressing their general acceptance of the amendments approved by the Executive Council and their willingness to work constructively towards compromise texts for the two Articles that had been subject to intersessional negotiations and for any other proposals of a positive nature. 522

Some Delegates drew attention to minor textual anomalies. 523

The Delegate of Mexico, as leader of the intersessional consultations amongst concerned Member States on Article 2, paragraph 1, new sub-paragraph (j) read out a compromise text, prepared with Brazil and in consultation with several other countries, that was broadly acceptable but which some Delegates expressed certain reservations on. 524

The Delegate of Turkey explained that he considered the proposed amendments to the IOC Statutes as an effort to reflect appropriately in the work and functioning of the Commission certain generally accepted practices in the fields that fall within the Commission's competence. This, he said, was how he saw the main objective, nature and scope of the amendments designed to enhance the role of the Commission. However, he wished formally to state that it was his considered opinion that this endeavour cannot be construed as implying, in any way, recognition and application of the UN Convention on the Law of the Sea which has not yet entered into force. 525

Dr. Ayala-Castañares proposed that the details of wording for all amendments under consideration be considered by an ad hoc Sessional Drafting Group. 526

The Assembly invited the following Member States to constitute, under the Chairmanship of Dr. Ayala-Castañares, an ad hoc Sessional Drafting Group on Amendments to the IOC Statutes: Algeria, Argentina, Brazil, Bulgaria, Canada, Chile, China, Costa Rica, Cuba, Denmark, Japan, Mexico, UkSSR, USSR, UK, USA, Venezuela. 527

The Assembly considered the report of this ad hoc Sessional Drafting Group. It approved in principle, without further discussion, all amendments that had been approved by the Executive Council, through Resolution EC-XIX.8, and on which no Delegate in Plenary or in this Sessional Drafting Group at the present Assembly, had raised any further point of discussion: Article 1, paragraphs 2 and 3; Article 2, paragraph 1, sub-paragraphs (f) (new), (g) (new), (h) (former (g)), (i) (former (h)), (k) (new), (l) (new), (m) (former (l)), and paragraphs 2 and 3; Article 3, Article 4, Article 5, paragraph (4a), and Article 9, paragraph 1. It noted that two general questions of style and/or semantics were agreed by the ad hoc Sessional Drafting Group: (i) that the term "oceans" should be understood (without being expressed formally in the Statutes) as a generic term including all seas with a marine connection to the oceans (in the geographical sense); and (ii) that any reference to "services" (understood as services provided or promoted by the Commission) should be rendered throughout the Statutes as "ocean services". 528

529 The Assembly agreed with this editorial improvement, and therefore that Article 2, paragraph 1, sub-paragraphs (b) and (c) would be thereby amended by insertion of the word "oceans" between the words "related" and "services", thus bringing them into line with an agreed similar amendment to Article 1, paragraph 2.

530 The Assembly considered carefully the amendments to Article 1, paragraph 1, Article 5, paragraph 4 (b), and Article 10, paragraphs 2 and 3, proposed by the ad hoc Sessional Drafting Group.

531 The amendment to Article 1, paragraph 1, originally proposed by the Executive Council at its Nineteenth Session, was considered by the Unesco Legal Adviser to pose certain constitutional difficulties; to solve these, and in response to a proposal by the First Vice-Chairman, the Legal Adviser proposed the creation of two sub-paragraphs, (a) and (b), to separate the constitutional status of the Commission within Unesco from the general definition of the Commission's position in respect of programme conception and implementation.

532 The Assembly noted that the ad hoc Sessional Drafting Group had accepted the Legal Adviser's proposal verbatim and agreed in principle Article 1, paragraph 1 with this amendment.

533 The amendment (with respect to that recommended by the Executive Council) to Article 5, paragraph 4 (b)) proposed by the ad hoc Sessional Drafting Group was essentially of form rather than of substance, the former proposed text being viewed as too complicated and not properly related to the context (i.e., paragraphs 1, 2, 3, 4a, 5 and 6 of this Article).

534 The Assembly approved in principle the version of Article 5, paragraph 4(b) proposed by the ad hoc Sessional Drafting Group.

535 The ad hoc Sessional Drafting Group had noted that the proposal (by the USSR pursuant to Resolution EC-XIX.8) of an amendment to Article 10, paragraph 2, embodied the principle that the Commission may finance its expenditures from all available sources including Member States of the Commission that are not Member States of Unesco. The ad hoc Sessional Drafting Group had therefore recommended the proposed amendment.

536 The Assembly approved in principle the version of Article 10, paragraph 2 proposed by the ad hoc Sessional Drafting Group.

537 The ad hoc Sessional Drafting Group recognized that, if the foregoing proposed amendment were accepted, the text of Article 10, paragraph 3, could remain as in the present Statutes, and so recommended.

538 The Assembly approved in principle this recommendation.

539 In view of the difficulty of finding a compromise text to Article 2, paragraph 1, new sub-paragraph (j), yet recognizing that there was a considerable will amongst the Delegates to arrive at a consensus thereon, the Assembly decided to create another ad hoc Sessional Drafting Group on Proposed Amendments to Article 2, paragraph 1, new sub-paragraph (j), with a membership comprising the same Member States as in the previous ad hoc Sessional Drafting Group and five additional Member States that had been

particularly active in the discussions: Algeria, Argentina, Brazil, Bulgaria, Canada, Chile, China, Costa Rica, Cuba, Denmark, Egypt, Greece, India, Japan, Kenya, Mexico, Peru, UkSSR, USSR, UK, USA and Venezuela.

540 *The Assembly invited* Dr. Agustin Ayala-Castañares to be the Chairman of this *ad hoc* Sessional Drafting Group, *and gave* it the following remit: to draw up a text for Article 2, paragraph 1, new sub-paragraph (j) that, in its substance and its wording, can be expected to receive the consensus of the Member States of the Commission participating in the Fourteenth Session of the Assembly, using, as a working text, that proposed by the *ad hoc* Sessional Drafting Group on Amendments to the IOC Statutes, taking into account the views expressed by the Member States during discussion on this subject at the Fourteenth Session.

541 In the meeting of the *ad hoc* Sessional Drafting Group, the Delegate of Brazil, on behalf of Mexico and other countries that had worked hard to produce a compromise text, defined three basic element to the Proposed Text: (i) the function of the IOC to promote scientific research of the oceans and (as a new element relative to the present Statutes) the application of the results thereof; (ii) the modalities - how to assist the Member States; (iii) protection of the rights of coastal States. In his view, the basic text does not contradict the UN Convention on the Law of the Sea.

542 The Chairman of the *ad hoc* Sessional Drafting Group invited the Delegate of USA to explain the basis of his earlier difficulties with the proposed text.

543 The Delegate of the USA explained the basis of his country's difficulties with the text proposed by Mexico and Brazil. First, the Statutes must be directed to serving the Commission, and should not be amended simply to achieve particular legal objectives. The changes proposed to the Statutes in general at this time are designed to expand the range of functions (e.g., provide ocean services, standards, etc.) or to improve them. The proposed text for Article 2 (1) (j) represents a major change for which there has not been much time for study. Also, the text in English is somewhat confusing, more so than the original Spanish. He indicated that it is essential to ensure that this amendment is carefully worded so that it does not, when adopted, contradict the UN Convention on the Law of the Sea. The main criteria of amendment should be to make it easier for the Commission to do its work better. His specific objections to the proposed text were: (i) it deletes any reference to freedom of research; (ii) it is not clear what "application of results" means but this change is acceptable if the meaning is clarified in the Summary Report of this Session of the Assembly; (iii) the middle part on modalities could be interpreted restrictively; modalities change and a more rapid mechanism than amendments to the Statutes should be used (e.g., Resolutions); (iv) it is not clear what is to be meant by the term "regime" in the last point of the basic text - it could be interpreted to refer to Law of the Sea rules, customary international law, national definitions or some other definition.

544 Some Delegates in the meeting of the *ad hoc* Sessional Draft Group indicated that the rights of all IOC Member States were protected by paragraph 3 of Article 2 and suggested the possibility of transferring the ideas in the last sentence of the basic text of 2 (1) (j) to there. Two

Delegates suggested that a reworked Article 2 (3) could be made applicable to all Articles by creating a new final Article out of Article 2(3) modified. Several Delegates pointed out that the text would be a compromise text and could not satisfy all Member States in every respect. They stressed the importance of not establishing two regimes ("UNCLOS" and "IOC") for the conduct of marine scientific research in zones under national jurisdiction.

545 Taking into account the views expressing by various Delegates that had participated in the ad hoc Sessional Drafting Group, the Delegates of Mexico and Brazil drafted an amended text which was accepted by consensus in the Sessional Drafting Group.

546 The Assembly welcomed the constructive spirit that had prevailed in the ad hoc Sessional Drafting Group and recognized that the compromise text proposed could not fully satisfy all the preferences of all Member States.

547 ◗ The Assembly approved in principle the text proposed by the ad hoc Sessional Drafting Group for Article 2, paragraph 1, new sub-paragraph (j).

548 The Delegate of Turkey informed the Assembly that it was his country's considered opinion that the agreed text for Article 2, paragraph 1, new sub-paragraph (j) solely reflects and refers to the rules of customary international law.

549 The Delegate of the United Kingdom asked to be placed on the record the UK's view that, in supporting this new text, which may in due course become Article 2, paragraph 1(j) of the IOC Statutes, it was not his country's intention to restrict in any way the availability of the oceans for research and other uses. So far as the United Kingdom was concerned, the new text would be considered as being without prejudice to the provisions of other agreements.

550 The Assembly then considered one by one the amendments to Articles 1, 2, 3, 4, 5, 9 and 10 already approved in principle.

551 ◗ With 79 Member States present, thus ensuring the majority of Member States required by Rule of Procedure No. 56 (3), pursuant to Article 13 of the IOC Statutes, the Assembly approved the amendments to each Article by unanimity.

552 ◗ The Assembly adopted Resolution XIV-19, with the approved amendments to the Statutes in the Annex to this Resolution.

553 ▲ It instructed the Secretary, when finalizing the Annex to this Resolution, for submission to the General Conference of Unesco, to place the present text of the Statutes beside the proposed new text, with all new text (relative to the present text of the Statutes) underlined or appropriately indicated, so as to facilitate comprehension.

554 ▲ The Assembly noted that, in approving the proposed amendments, Member States not using English as an official language reserved the right to check the correctness of all official translations of the revised Articles. It instructed the Secretary to arrange for official translations

into other official languages of the Commission (French, Russian and Spanish), as well as into Arabic and Chinese, and to submit them to the Member States concerned for final comment on the correctness of the translation from the English.

The Assembly adopted Resolution XIV-19. 555

10.2 MEASURES TO ENHANCE THE STABILITY OF IOC RESOURCES

556 The First Vice-Chairman, Mlle Marie-Annic Martin Sané introduced this subject. She called the attention of the Assembly to the study she had prepared on Measures Needed to Ensure Adequate and Dependable Resources for the Commission's Programme of Work (Document IOC-XIV/12), which had been undertaken following consideration by the Nineteenth Session of the Executive Council of a first-stage study found in Document IOC/EC-XIX/11. She reminded the Assembly that rapid expansion of the Commission's Programme unfortunately coincided with a sharp decrease in the resources that Unesco was able to provide to IOC. This had resulted in a critical shortage of staff and funding which risked compromising the future evolution of IOC activities, especially in the area of ocean services where adequate and dependable resources are most essential to the gradual establishment of global ocean-observing systems.

557 In such a new situation, innovative solutions must be sought. Some suggestions as to possible avenues to pursue are included in the two studies developed so far. The First Vice-Chairman expressed the view that further in-depth study by persons familiar with the work of the Commission was required, in close consultation with the Member States, in order to explore adequately the issues identified by the Nineteenth Session of the Executive Council and those that would arise during the Assembly. To that end, she had prepared a draft resolution on the establishment of an ad hoc Study Group to work during the intersessional period and report on its conclusions to the Twenty-first Session of the Executive Council.

558 In the ensuing debate, many Delegates expressed their appreciation for the work undertaken by the First Vice-Chairman and for the valuable information contained in the two studies that she had carried out. There was general agreement that the problems associated with the resources of the Commission should be viewed from two perspectives: one on immediate difficulties, which had been discussed under Agenda Item 9.2 in regard to the IOC Programme and Budget for 1988-1989; and another on medium and long-term solutions, including alternative institutional arrangements.

559 Some Delegates referred to the importance of bearing in mind the question of priorities in programme planning and implementation, though recognizing, as had been expressed at the Nineteenth Session of the Executive Council, that this is a complicated and delicate task in view of the diverse interests of Member States. Nevertheless, in a period of economic constraint, it was felt that the proposed Study Group should take into account the ways in which additional resources could be found for acceleration of programmes of particular interest during a given budgetary period.

560 The Assembly recalled that deliberations of the IOC Subsidiary Bodies and subsequent decisions of the Governing Bodies offered an adequate opportunity for identification of priorities in programme planning and implementation.

561 The Assembly endorsed the views expressed by the Executive Council at its Nineteenth Session (Document IOC/EC-XIX/3, paras 297-319).

562 Having considered the proposal of the First Vice-Chairman, the Assembly decided to establish an ad hoc Study Group on Ensuring Adequate and Dependable Resources for the Commission's Programme of Work; it requested the ad hoc Study Group to take the above-mentioned views into account in its deliberations, and the Executive Council, at its Twenty-first Session, to consider the Report of the ad hoc Study Group.

563 The Assembly recalled that the proposed ad hoc Study Group on Measures to Ensure Adequate and Dependable Resources will address the question of diversity in sources of funding and how this affects formulation of the programme and related decision-making procedures (item (i) of its Terms of Reference).

564 The Assembly adopted Resolution XIV-20.

11. ELECTIONS

565 The Chairman of the Nominations Committee informed the Assembly that all nominations received for election either to the position of office bearer or to the Executive Council had been found valid. He also reported that, in the course of its debates, the Nominations Committee was faced with some discrepancies between the different language versions of Document IOC/INF-620 rev. "Technical Arrangements for the Biennial Elections of Officers of the Commission and Other Members of the Executive Council", especially with regard to the mandatory use of the form attached to this document for nominations for election to the Executive Council. The Nominations Committee therefore urged the Secretary to make sure that such discrepancies be corrected in the future to the effect that the timely use of the ad hoc forms would be universally understood as being mandatory.

11.1 ELECTION OF THE OFFICERS OF THE COMMISSION

566 The Chairman informed the Assembly that there was only one candidate for each post of Officer of the Commission; all were well known to the Commission and needed no introduction:

Chairman : Prof. Ulf Lie (Norway)
First Vice-Chairman : Dr. Manuel Murillo (Costa Rica)
Second Vice-Chairman : Prof. Alexander Yankov (Bulgaria)
Third Vice-Chairman : Mr. Samuel Allela (Kenya)
Fourth Vice-Chairman : Dr. Aprilani Soegiarto (Indonesia)

567 The Assembly elected these five candidates by acclamation.

11.2 ELECTION OF THE MEMBERS OF THE EXECUTIVE COUNCIL

The Chairman then informed the Assembly that 32 Member States were candidates to 28 seats on the Executive Council (following Rule of Procedure No.18). He called on the Member States to consider the possibility of reducing the number of candidates to accord with the number of seats on the Executive Council by common agreement in the light of the practice of the Commission to ensure appropriate geographical representation taking into account the desirability of having all the major ocean basins well represented. 568

The Chairman suspended the Session for this purpose. However, no agreement was reached and a vote was therefore organized to elect the remaining seats on the Executive Council, pursuant to Rule of Procedure 47. 569

The newly elected Officers of the Commission and the Member States of the Executive Council, and their named Representatives, as well as the List of Member States of the Commission, are given in Annex IV hereto. 570

12. DATES AND PLACES OF THE FIFTEENTH SESSION OF THE ASSEMBLY, TWENTY-FIRST AND TWENTY-SECOND SESSIONS OF THE EXECUTIVE COUNCIL

The Secretary recalled the practice of the Commission to hold its Governing Body Sessions in February or March. To avoid difficulties arising from local national holidays, he proposed that the Twenty-first Session of the Executive Council take place in Paris in March 1988, and the Twenty-second Session of the Council and the Fifteenth Session of the Assembly take place in Paris in March 1989; the precise dates would be decided in the light of the usual scheduling criteria. 571

The Assembly agreed to this proposal. 572

13. ADOPTION OF THE SUMMARY REPORT

The Assembly considered the Draft Summary Report. After amendment, the Assembly adopted this Report and instructed the Secretary, in consultation with the Chairman, to undertake the normal editing and preparation for printing. 573

14. CLOSURE

The incoming Chairman, Prof. Ulf Lie, praised the outgoing Chairman's activity and commitment during his tenure to promote the Commission. He particularly welcomed the friendly and constructive spirit in which Prof. Ronquillo had conducted the Sessions of the Assembly and the Executive Council, and hoped that he would continue to associate himself with the work of the Commission and to develop marine science in the Philippines. 574

575 Prof. Ronquillo expressed his appreciation of the new Chairman's kind words and his expectation that under Prof. Lie's leadership the Commission would use to new heights.

576 The Assembly recognized that its work can only proceed effectively through the effort of its Officers, and of its Secretariat. Noting that the terms of office of the present Chairman, Prof. Inocencio Ronquillo (Philippines), First Vice-Chairman, Mlle Marie-Annic Martin-Sané (France), Second Vice-Chairman, Dr. José Antonio Galavis Seidel (Venezuela) and Third Vice-Chairman, Prof. Klaus Voigt (German Democratic Republic), had come to an end at the present Session, and recalling the dedicated services rendered to it by these four Officers, since their election in 1982 at its Twelfth Session, the Assembly expressed its sincere thanks to Prof. Ronquillo, Mlle Martin-Sané, Dr Galavis and Prof. Voigt and its hope that they will continue to be closely associated with the Commission and its work.

577 Numerous Delegates expressed their appreciation of the work of Prof. Ronquillo and his fellow Officers as well as the effective work of the Secretary and staff, including the interpretation team, at the present Session.

578 The Past Chairman, Dr. Agustin Ayala-Castañares, thanked the outgoing Chairman and Vice-Chairmen for their great efforts to advance the Commission and presented the outgoing Chairman with a gift from the Delegates.

579 The outgoing Second Vice-Chairman, Dr. Jose Antonio Galavis Seidel, assured the Assembly of his intention to continue to support the IOC and to seek the greatest possible involvement of his country in the Commission.

580 The Delegates of Algeria and Egypt, while recognizing the practical and financial constraints on introducing Arabic interpretation into Sessions of the Assembly, called upon the Commission to consider translation of key Working Documents into Arabic for Assembly Sessions.

581 The Delegate of China asked for similar consideration with respect to Chinese.

582 The Secretary expressed his appreciation of the support he had received from the Chairman and from the Vice-Chairmen, from the Member States in general and from his staff.

583 The Chairman thanked the Delegates for their constructive interventions in the debate. He reminded then that few meetings of a scientific nature cover such a wide range of topics as an IOC Assembly Session, and that the Commission is the major world forum for the planning, promotion and co-ordination of international co-operation in the marine sciences and related ocean services. He thanked his fellow Officers for their constructive help, notably the First Vice-Chairman, Mlle Marie-Annic Martin-Sané, and the Past Chairman, Dr. Ayala Castañares, who had acted for him on several occasions. He praised the devotion of the Secretariat and he thanked the Advisory Bodies for their continuing support.

584 The Chairman closed the Session at 17.30 on 1 April 1987.

ANNEX I

AGENDA

1. Opening

2. Bruun Memorial Lectures

3. Administrative Arrangements

   3.1 Adoption of the Agenda
   3.2 Designation of the Rapporteur
   3.3 Conduct of the Session, Timetable and Documentation

4. Report on Activities of the Commission

   4.1 Secretary's Report on Intersessional Activities
   4.2 Adoption of the Biennial Report for 1985-86

5. Ocean Sciences

   5.1 Ocean Science in Relation to Living Resources (OSLR)
   5.2 Ocean Science in Relation to Non-living Resources (OSNLR)
   5.3 Ocean Mapping
   5.4 Ocean Dynamics and Climate
   5.5 Marine Pollution Research and Monitoring

6. Ocean Services

   6.1 Integrated Global Ocean Services System (IGOSS)
   6.2 Ocean Observing Systems
   6.3 International Oceanographic Data Exchange and Marine Information Management
   6.4 International Tsunami Warning System in the Pacific

7. Regional Subsidiary Bodies

   7.1 Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE)
   7.2 Programme Group for the Western Pacifc (WESTPAC)
   7.3 Programme Group for the Central Eastern Atlantic (IOCEA)
   7.4 Joint IOC-WMO-CPPS Working Group on the Investigations of El Niño

8. Co-operation with other Organizations of the UN System and other Bodies

   8.1 Twenty-fifth Session of the Inter-Secretariat Committee on Scientific Programmes Relating to Oceanography (ICSPRO)
   8.2 Enhancing Co-operation between the IOC and the Unesco Division of Marine Science

9. Medium-Term Plan, Programme and Budget

   9.1 IOC Contribution to the Unesco Medium-Term Plan for 1990-95
   9.2 IOC Programme and Budget for 1988-89
   9.3 Programme and Budget of the Unesco Division of Marine Sciences, 1988-89

10. Enhancing the Role of the Commission
    - 10.1 Amendments to the IOC Statutes
    - 10.2 Measures to Enhance the Stability of IOC Resources

11. Elections
    - 11.1 Election of the Officers of the Commission
    - 11.2 Election of the Members of the Executive Council

12. Dates and Places of the Fifteenth Session of the Assembly, Twenty-first and Twenty-second Sessions of the Executive Council

13. Adoption of the Summary Report

14. Closure

ANNEX II

ADOPTED RESOLUTIONS

Resolution number	Agenda Item	Title
XIV-1	5.3.2	International Bathymetric Chart of the Central Eastern Atlantic (IBCEA)
XIV-2	5.4	Promotion of the Oceanographic Components of the World Climate Research Programme (WCRP)
XIV-3	5.5	Global Investigation of Pollution in the Marine Environment
XIV-4	5.5	Group of Experts on Effects of Pollutants
XIV-5	5.5	Group of Experts on Standards and Reference Materials
XIV-6	5.5.4	Potential IOC Involvement in the Oceanographic Components of the International Geosphere-Biosphere Programme
XIV-7	5.5.4	Joint Global Ocean Flux Study (JGOFS)
XIV-8	6.3	International Oceanographic Data and Information Exchange (IODE)
XIV-9	6.3.2	Marine Information Management
XIV-10	7.1	Work of the IOC Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE)
XIV-11	7.3	Work of the IOC Regional Committee for the Central Eastern Atlantic (IOCEA)
XIV-12	7.4	Regional Study of the Phenomenon known as "El Niño"
XIV-13	8.1.2	Joint Oceanographic Assembly - 1988
XIV-14	8.2	Revised Terms of Reference for the Technical Committee for TEMA and Strengthened Co-operation with the Unesco Division of Marine Sciences
XIV-15	8.3	Co-operation between IOC and UNEP in Marine Pollution Research and Monitoring
XIV-16	9.1	Third Unesco Medium-term Plan (1990-95)
XIV-17	9.2	Proposal on the IOC Programme and Budget for 1988-89
XIV-18	9.3	Programme and Budget of the Unesco Division of Marine Sciences for 1988-89
XIV-19	10.1	Proposed Amendments of the Statutes of the Commission
XIV-20	10.2	Measures to Ensure Adequate and Dependable Resources for the Commission's Programme of Work

Resolution XIV-1

INTERNATIONAL BATHYMETRIC CHART OF THE CENTRAL EASTERN ATLANTIC (IBCEA)

The Intergovernmental Oceanographic Commission,

Noting Recommendation IOCEA-I.3, in which the IOC Regional Committee for the Central Eastern Atlantic, at its First Session, recommended that the IOC undertake the preparation of an International Bathymetric Chart of the Central Eastern Atlantic,

Also noting, with appreciation, the generous offer of France to assist in the preparation of the above-mentioned bathymetric chart,

Establishes an Editorial Board for the International Bathymetric Chart of the Central Eastern Atlantic, with the Terms of Reference annexed to this Resolution;

Instructs the Secretary: (i) to invite Member States of the region and other interested Member States to submit candidatures of experts to be considered for membership of the Editorial Board; (ii) to invite France to designate the national institution to assume the responsibility of final drafting and printing of the IBCEA; (iii) to seek extra-budgetary funds for this activity;

Invites the International Hydrographic Organization, through the Eastern Atlantic Regional Hydrographic Commission, to work in close collaboration with the Editorial Board for IBCEA in matters related to the assembly of available bathymetric data and the compilation of material for inclusion in the international series of nautical and bathymetric charts, in the area.

Financial implications: Foreseen in Draft 24 C/5.

Annex to Resolution XIV-1

TERMS OF REFERENCE FOR THE EDITORIAL BOARD FOR THE INTERNATIONAL BATHYMETRIC CHART OF THE CENTRAL EASTERN ATLANTIC

The IOC Editorial Board for the International Bathymetric Chart of the Central Eastern Atlantic shall:

1. BASIC FUNCTIONS

Supervise the preparation and publication of the IOC International Bathymetric Chart of the Central Eastern Atlantic (IBCEA) using all available bathymetric data as input to the series, taking into account, in particular, the holdings of the World Data Centre for Bathymetry (IHO) and World Data Centre "A" (Marine Geology and Geophysics), and subsequently consider the need to prepare and publish overlay sheets of geological and geophysical parameters.

2. PROGRAMME DEVELOPMENT

2.1 PLANNING

Prepare a detailed plan of action for carrying out the project and activities, to be submitted to the IOC Consultative Group on Ocean Mapping (CGOM) for its consideration.

2.2 PROMOTION

Promote the IBCEA and related supporting activities in the Member States of the IOC Regional Committee for the Central Eastern Atlantic (IOCEA) and in their marine scientific communities.

2.3 CO-ORDINATION

Identify the participating entities (institutions, individual scientists and experts), keep them informed of the actions that each of them is expected to undertake in the implementation of the IBCEA and on activities being taken by the other participating entities, so as to avoid unnecessary duplication of effort and to optimize results.

2.4 SCIENTIFIC AND TECHNICAL ADVICE

Advise the participating entities, as appropriate, of the methods and procedures to be used in carrying out the work related to the agreed project and activities and on any methodological questions falling within the Editorial Board's sphere of competence.

Advise the Member States of the Regional Committee for IOCEA on the requirements for Training, Education and Mutual Assistance in the marine sciences (TEMA) related to the IBCEA, and advise the IOC of these requirements.

2.5 COLLABORATION

Collaborate with the IOC Consultative Group on Ocean Mapping concerning the technical specifications for the IBCEA, taking into account the 'Specifications for International Bathymetric Charts' (Annex IV to Document IOC/CGOM-II/3) produced under Regional Mapping Projects, and, when appropriate, with similar Editorial Boards and other expert groups active in the field of ocean mapping.

2.6 EVALUATION

Evaluate progress in the implementation of agreed projects and activities, with a view to proposing new approaches or new directions in the light of results achieved.

3. OTHER FUNCTIONS

3.1 TECHNICAL POLICY

Advise the Member States participating in the IBCEA on technical requirements for the effective implementation of the agreed projects and activities for the achievement of the Editorial Board's objectives in this field.

3.2 REPORTING

Present a Report on its activities and progress to each session of the Consultative Group on Ocean Mapping, and inform the Regional Committee for the Central Eastern Atlantic (IOCEA) on scientific and technical aspects of its activities.

Resolution XIV-2

PROMOTION OF THE OCEAN COMPONENTS OF THE WORLD CLIMATE RESEARCH PROGRAMME (WCRP)

The Intergovernmental Oceanographic Commission,

Having received the Executive Summary of the Second Session of the Technical Committee on Ocean Processes and Climate, [1]

Recognizing the importance of providing a forum in which requirements for intergovernmental operational support of WCRP oceanographic programmes can be presented by interested scientists and WCRP scientific planning groups,

Re-affirming its role as the body responsible for overall intergovernmental co-ordination of the oceanographic components of the WCRP,

Considering also the need to define further its role in promoting and encouraging such operational support, especially with respect to the development of a global ocean observing system,

Considering it essential to promote and encourage the strongest possible support for the Tropical Oceans and Global Atmosphere Study (TOGA) and the World Ocean Circulation Experiment (WOCE) by IOC Member States,

Having been informed that the detailed scientific plan for WOCE, entitled the "WOCE Implementation Plan", is scheduled to be distributed in early 1988,

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[1] This subsidiary body was formerly the IOC Programme Group on Ocean Processes and Climate, and the Summary Report of the Second Session was so entitled (Document IOC/PC-OPC-II/3).

Having reviewed the GLOSS Implementation Plan (Doc. IOC/INF-663 rev.) which will be published in the IOC Technical Series after incorporation of comments, corrections and statements of commitments to be submitted by Member States,

Emphasizing the urgent need to assist developing countries in participating more broadly in the TOGA Study, especially in making ocean observations in the Indian Ocean and other data-sparse areas,

Taking into account proposals made by the Joint SCOR-IOC Committee on Climatic Changes and the Ocean (CCCO) and by IOC subsidiary bodies on TEMA activities in support of the WCRP,

Noting the rapid development of various new techniques for ocean observation which are already being used by certain countries and planned to be used within the framework of the WCRP, including satellite altimetry, satellite scatterometry and passive micro-wave radiometry, ocean spectrometry, acoustic current profiling, acoustic tomography and other innovations in hydrographic and hydrochemical measurements,

Wishing to ensure the compatibility of data obtained through the use of these new techniques,

A

Ocean Processes and Climate

Accepts the Executive Summary of the Second Session of the Technical Committee on Ocean Processes and Climate, and the Resolution and Recommendations therein;

Decides to implement fully and immediately the Resolution and Recommendations adopted by the Technical Committee at its Second Session, as summarized herein;

Reconfirms that the Technical Committee should continue to serve as the appropriate subsidiary body to promote intergovernmental co-ordination of activities related to the development of the oceanographic components of the WCRP and relevant national and multinational research programmes;

Urges Member States to promote WCRP activities, recognizing that the Programme needs research and data from the total ocean environment;

B

TOGA and WOCE

Endorses the establishment of the Joint WMO-IOC Intergovernmental TOGA Board (ITB) with the Terms of Reference and composition specified in WMO Resolution 13, EC-XXXVIII, 1986;

Agrees to support participation of oceanographic experts from developing countries contributing to TOGA in relevant activities of the ITB;

Agrees to host an International WOCE Scientific Conference to be sponsored jointly by IOC, WMO, ICSU and SCOR and convened in late 1988 (now being planned by the SCOR-IOC CCCO and the Joint Scientific Committee (JSC) for the WCRP with support from their parent organizations);

Invites interested UN agencies to provide additional financial support for this Conference, especially to ensure the fullest possible participation in the Conference by scientists and governmental experts from developing Member States;

Requests the Technical Committee on Ocean Processes and Climate, in consultation with the SCOR-IOC CCCO and supporting countries, to keep under review the operations of the International TOGA Project Office (ITPO) and the WOCE International Planning Office (WOCE/IPO) and bring to the attention of the IOC any problems or issues that may arise regarding these operations that require action by the IOC;

C

GLOSS

Approves the convening of the Second Session of the Task Team of Experts on GLOSS in 1987 to: (i) review and update the GLOSS Implementation Plan, and (ii) advise IOC on actions needed to improve the implementation of GLOSS;

Urges Member States to provide assistance to developing countries in broadening and improving their participation in GLOSS, especially in areas identified in the GLOSS Implementation Plan;

Welcomes the offers of France and Portugal to hold sea-level training courses for French- and Portuguese-speaking countries, respectively;

Invites other countries to host similar courses;

Also urges Member States to submit sea-level data to the Permanent Service for Mean Sea Level, the TOGA Sea-Level Centre and the Specialized Oceanographic Centre for the IGOSS Sea-Level Pilot Project in the Pacific, in accordance with the GLOSS Implementation Plan;

D

TEMA

Invites the Unesco Division of Marine Sciences to collaborate with the IOC and help provide support for various training and assistance activities identified by the SCOR-IOC CCCO and other IOC subsidiary bodies to increase participation of developing countries in the WCRP, giving priority to the training of scientists from developing countries to enable them to analyse, interpret and apply the results and data, as well as participate in the observational aspects of climate research, and addressing needs related to programmes such as GLOSS, IGOSS, and IODE;

Requests the SCOR-IOC CCCO to consider ways and means of distributing information to Member States relating to the scientific and economic benefits arising from ocean climate research;

Also requests the SCOR-IOC CCCO to prepare a report on new ocean-observing techniques;

Offers to co-sponsor, with WMO, appropriate joint climate-related training programmes for developing countries;

Urges Member States to provide equipment, spare parts, technical assistance, expert guidance, training courses, grants and fellowships and other support to developing countries, under the Voluntary Co-operation Programme and other appropriate arrangements;

E

New Technology, Data Compatibility and Access to Data

Invites SCOR to address problems of intercalibration, standardization and data formats for new ocean-observing technology as a matter of urgency;

Requests the Joint IOC-WMO Working[1] Committee for IGOSS and the Technical Committee for IODE to give high priority to these problems, and to ensure access by all users to ocean-climate data and information collected under the WCRP (TOGA and WOCE).

Financial implications: Foreseen in Draft 24 C/5 (partly); voluntary contributions (partly)

Resolution XIV-3

GLOBAL INVESTIGATION OF POLLUTION IN THE MARINE ENVIRONMENT

The Intergovernmental Oceanographic Commission,

A

Approves the Summary Report of the Sixth Session of the Scientific Committee for GIPME (Document IOC/WC-GIPME-VI/3) and the Recommendations therein;

Endorses the Action Plan for the GIPME Programme;

Instructs the Secretary, together with the Officers of the Programme, to establish a corresponding work plan.

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[1] This subsidiary body falls in the category of Scientific and/or Technical Committees. The change of name must, however, be negotiated with the World Meteorological Organization, as a co-sponsor.

B

Noting the considerable support given by some Member States to the GIPME Programme by, inter alia, the secondment of experts to support the staff of the Secretariat of the Commission,
Expressing its appreciation of the work of RNODCs in the collection of data on marine pollution monitoring,

Urges Member States to increase their involvement in, and to promote support to, the GIPME Programme, especially by improving their submission of marine pollution data through RNODCs MARPOLMON.

C

Being aware of the increasing role of the Scientific Committee for GIPME as the appropriate intergovernmental mechanism for the promotion and co-ordination of marine pollution research and monitoring in the UN System,

Recalling Resolution XII-18 entitled "IOC Co-sponsorship of GESAMP",

Reaffirms its desire to become a co-sponsor of GESAMP;

Requests the Director-General of Unesco to renew efforts to explore such co-sponsorship with the other UN organizations concerned.

Financial implications: Foreseen in Draft 24 C/5 (partly); voluntary contributions (partly).

Resolution XIV-4

GROUP OF EXPERTS ON EFFECTS OF POLLUTANTS

The Intergovernmental Oceanographic Commission,

Noting Recommendation SC-GIPME-VI.5 of the Scientific Committee for GIPME, concerning co-sponsorship of the Group of Experts on Effects of Pollutants (GEEP),

Welcomes the decision of IMO and UNEP to co-sponsor the Group of Experts on Effects of Pollutants as a joint group on the biological effects of pollutants on marine organisms, their populations and ecosystems;

Adopts the agreed revised Terms of Reference given in the Annex to this Resolution;

Invites IMO and UNEP each to nominate a Technical Secretary for GEEP, with IOC acting as Technical Co-ordinator on behalf of the three co-sponsors;

Decides that, depending upon the Agenda, the attendance of experts in any one session of GEEP shall be established jointly by the IOC, IMO and UNEP in consultation with the Chairman of GEEP, the maximum number of participants nominated by each co-sponsor not to exceed 5.

Financial implications: Foreseen in Draft 24 C/5 (partly); voluntary contributions (partly).

Annex to Resolution XIV-4

REVISED TERMS OF REFERENCE OF THE IOC-IMO-UNEP GROUP OF EXPERTS ON EFFECTS OF POLLUTANTS[1]

The IOC-IMO-UNEP Group of Experts on Effects of Pollutants shall:

1. BASIC FUNCTION

Assist the Scientific Committee for the Global Investigation of Pollution in the Marine Environment in: reviewing the state of knowledge of the effects of pollutants and identifying ways of filling the gaps in this knowledge; development of the relevant methodology, particularly that needed for monitoring and research programmes carried out or sponsored by IOC, IMO and UNEP; developing strategies for large-scale monitoring of biological effects of pollutants, suitable for identification of species, ecosystems or habitats requiring special protection; and identifying control measures that may be used in coastal management.

2. PROGRAMME DEVELOPMENT

2.1 PLANNING

Prepare a detailed plan of action for carrying out the projects and activities adopted or approved by the Scientific Committee for GIPME in this field.

2.2 PROMOTION

Assist in the promotion, in the Member States of the Scientific Committee for GIPME and in their marine scientific communities, of the agreed projects or activities.

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[1] These Terms of Reference have been drafted in the light of the Guidelines on the Structure and Responsibilities of the Subsidiary Bodies of the Commission approved by the IOC Executive Council at its Nineteenth Session.

2.3 CO-ORDINATION

Identify the participating entities (institutions, individual scientists, as the case may be), inform them of the actions each is expected to undertake in the implementation of the agreed projects and activities, and generally inform each participating entity of the actions being taken by the other participating entities, so as to avoid unnecessary duplication of effort.

2.4 SCIENTIFIC AND TECHNICAL ADVICE

Advise the Scientific Committee for GIPME on the methods and procedures to be preferred in carrying out the work relating to the agreed projects and activities.

Advise the participating entities, as appropriate, of such methods and procedures, and on any methodological question falling within the Group of Experts' sphere of competence.

Advise the Scientific Committee on the requirements for Training, Education and Mutual Assistance in the Marine Sciences (TEMA) relative to the Group's sphere of activity.

2.5 COLLABORATION

Collaborate with the GIPME Groups of Experts on Methods, Standards and Intercalibration (GEMSI) and on Standards and Reference Materials (GESREM), in the implementation of relevant activities in the field of pollutant effects, and, when appropriate, with similar expert groups active in this field.

2.6 EVALUATION

Evaluate progress in the implementation of agreed projects and activities with a view to proposing new approaches or new directions in the light of results achieved.

3. OTHER FUNCTIONS

3.1 TECHNICAL POLICY

Advise the Scientific Committee for GIPME on the technical requirements for the effective implementation of agreed projects and activities and for the achievement of the Scientific Committee's objectives in this field.

3.2 REPORTING

Report to the Scientific Committee for GIPME at each Session of the Committee, and to IMO and UNEP, on the scientific and technical aspects of its activities.

Resolution XIV-5

GROUP OF EXPERTS ON STANDARDS AND REFERENCE MATERIALS

The Intergovernmental Oceanographic Commission,

A

Recalling Resolution EC-XIX.2 on Standard Reference Materials for Marine Pollution and Chemistry,

Decides to adjust the name of the Group to "Group of Experts on Standards and Reference Materials (GESREM)", with the revised Terms of Reference attached as an Annex to this Resolution, as proposed by the Scientific Committee for GIPME;

B

Noting with appreciation the decision of IAEA and UNEP to co-sponsor the Group,

Invites IAEA and UNEP each to nominate a Technical Secretary for GESREM, with IOC acting as Technical Co-ordinator on behalf of the three co-sponsors;

Decides that, depending upon the Agenda, the attendance of experts in any session of GESREM shall be established jointly by the IOC, IAEA and UNEP in consultation with the Chairman of GESREM, the maximum number of participants nominated by each co-sponsor not to exceed 4.

Financial implications: Foreseen in Draft 24 C/5.

Annex to Resolution XIV-5

TERMS OF REFERENCE OF THE IOC-IAEA-UNEP GROUP OF EXPERTS ON STANDARDS AND REFERENCE MATERIALS[1]

The IOC-IAEA-UNEP Group of Experts on Standards and Reference Materials shall:

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[1] These Terms of Reference have been drafted in the light of the Guidelines on the Structure and Responsibilities of the Subsidiary Bodies of the Commission approved by the IOC Executive Council at its Nineteenth Session.

1. BASIC FUNCTION

Assist the IOC Scientific Committee for the Global Investigation of Pollution in the Marine Environment in: determining the availability of standards and reference materials; the co-ordination of efforts to develop and distribute standards and reference materials; the resolution of analytical problems relating to the preparation of such materials; planning the long-term development of marine analytical chemistry reference materials, by recommending priorities and estimating resources needed to respond to the requirements of the sponsoring organizations; and promoting communication between marine and analytical chemistry groups, in the use of reference materials.

2. PROGRAMME DEVELOPMENT

2.1 PLANNING

Prepare a detailed plan of action for carrying out the projects and activities adopted or approved by the Scientific Committee for GIPME in this field.

2.2 PROMOTION

Assist in the promotion, in the Member States of the Scientific Committee for GIPME and in their marine scientific communities, of the agreed projects or activities.

2.3 CO-ORDINATION

Identify the participating entities (institutions, individual scientists, as the case may be), inform them of the actions each is expected to undertake in the implementation of the agreed projects and activities, and generally inform each participating entity of the actions being taken by the other participating entities, so as to avoid unnecessary duplication of effort.

2.4 SCIENTIFIC AND TECHNICAL ADVICE

Advise the Scientific Committee for GIPME on the methods and procedures to be preferred in carrying out the work relating to the agreed projects and activities.

Advise the participating entities, as appropriate, of such methods and procedures, and on any methodological question falling within the Group of Experts' sphere of competence.

Advise the Scientific Committee for GIPME on the requirements for Training, Education and Mutual Assistance in the Marine Sciences (TEMA) relative to the Group's sphere of activity.

2.5 COLLABORATION

Collaborate with the GIPME Groups of Experts on Methods, Standards and Intercalibration (GEMSI) and on the Effects of Pollutants (GEEP), in the implementation of relevant activities in the field of analytical standards and reference materials, and, when appropriate, with similar expert groups active in this field, notably the Joint SCOR-Unesco-ICES-IAPSO Panel on Oceanographic Tables and Standards (JPOTS), so as to avoid duplication of effort.

2.6 EVALUATION

Evaluate progress in the implementation of agreed projects and activities with a view to proposing new approaches or new directions in the light of results achieved.

3. OTHER FUNCTIONS

3.1 TECHNICAL POLICY

Advise the Scientific Committee for GIPME on the technical requirements for the effective implementation of agreed projects and activities and for the achievement of the Scientific Committee's objectives in this field.

3.2 REPORTING

Report to the Scientific Committee for GIPME at each Session of the Committee, and to the IAEA and UNEP, on the scientific and technical aspects of its activities.

Resolution XIV-6

POTENTIAL IOC INVOLVEMENT IN THE OCEANOGRAPHIC COMPONENTS OF THE INTERNATIONAL GEOSPHERE-BIOSPHERE PROGRAMME

The Intergovernmental Oceanographic Commission,

Noting the decision of the International Council of Scientific Unions (ICSU) to establish an International Geosphere-Biosphere Programme: A Study of Global Change,

Recognizing the importance of seeking a better understanding of the Earth and its immediate environment and the process of global change, including in the oceans,

Recognizing also that the objective of the IGBP is "to describe and understand the interactive physical, chemical and biological processes that regulate the total Earth system, the unique environment that it provides for life, the changes that are occurring in this system, and the manner in which they are influenced by human actions", Noting also that one of the major topics identified by ICSU for early emphasis in the IGBP is the study of marine ecosystems and atmospheric interactions,

Recognizing the importance of understanding how the world oceans influence global change,

Considering that certain IOC programmes are relevant to the objectives of the IGBP,

Noting further that the Scientific Committee on Oceanic Research (SCOR) is already playing a key role in planning oceanic research, such as the Joint Global Ocean Flux Study (JGOFS), that is relevant to the objectives of the IGBP,

Desiring to co-operate with ICSU in ensuring that the resources of the Member States of the IOC are effectively utilized to support the IGBP,

Considering it essential to promote and encourage the strongest appropriate support for the IGBP by IOC Member States, including the participation of oceanographic experts in the planning and implementation thereof,

Deeming it essential that the IOC, prior to the commencement of the IGBP, consider the nature and extent of its involvement in this Programme,

Instructs the Secretary to arrange for an ad hoc meeting to: (i) consider ways in which the IOC could contribute, through its programmes, to the IGBP, and (ii) report to the Fifteenth Session of the Assembly;

Invites interested Member States each to designate an expert competent in global ocean research or services and to support their attendance at this meeting;

Requests the major scientific and technical subsidiary bodies to participate in the meeting through an officer or designated expert.

Financial implications: Voluntary contributions.

Resolution XIV-7

JOINT GLOBAL OCEAN FLUX STUDY (JGOFS)

The Intergovernmental Oceanographic Commission,

Noting (i) the recent scientific progress and increasing international interest in global ocean flux studies, (ii) the particular interest expressed by the Scientific Committee for GIPME concerning the emerging International Global Ocean Flux Study, (iii) the International Scientific Planning and Co-ordination Meeting for Global Ocean Flux Studies convened by SCOR, 17-19 February 1987, Recognizing the potential mutual benefit of interaction between IOC and SCOR with respect to the Joint Global Ocean Flux Study (JGOFS),

Congratulates SCOR for having taken the initiative in convening an expert consultation aimed at formulating the possible scope and objectives of JGOFS,

Further noting that this expert consultation has proposed that SCOR establish a Scientific Planning Committee to carry out the next stages required to develop an international plan for JGOFS,

Encourages SCOR to complete its plan for JGOFS;

Requests SCOR to submit a report on that scientific plan to the IOC as soon as possible;

Requests that a technical representative of GIPME participate in the work of the SCOR Scientific Planning Committee in view of the particular interest in certain aspects of JGOFS expressed by the Scientific Committee for GIPME;

Decides that it would, in principle, be prepared to provide an intergovernmental mechanism for JGOFS, subject to a recommendation by SCOR;

Invites ICSU to consider, once the exact intergovernmental mechanism required for the programme has been decided, the incorporation, as appropriate, of JGOFS as a joint IOC-ICSU component of the International Geosphere-Biosphere Programme (IGBP).

Financial implications: None.

Resolution XIV-8

INTERNATIONAL OCEANOGRAPHIC DATA AND INFORMATION EXCHANGE (IODE)

The Intergovernmental Oceanographic Commission,

Recalling Resolution XIII-8 (International Oceanographic Data Exchange) and the decisions taken regarding IODE by the IOC Executive Council at its Nineteenth Session,

A

Approves the Report and Recommendations of the Twelfth Session of the IOC Working Committee on IODE;

B

Noting the rapid growth in demand for oceanographic data services to support global research programmes and for numerous technical applications, Being aware that many major programmes concerning environmental protection, control of natural disasters, and promotion of economic development objectives depend upon availability of real-time, near-real-time, delayed and historical environmental data from the oceans,

Bearing in mind previous Resolutions and Decisions of the IOC Governing Bodies urging Member States to increase support to the Commission's activities in oceanographic data exchange and information management and to adhere to the agreed procedures of IODE,

Expresses its concern over the lack of resources made available by Member States to NODCs to meet data requirements at national and international levels;

Urges Member States to make adequate resources available for the development of their national oceanographic data centres, and to improve communications between national, regional and world data centres;

Requests Member States to consider initiating, in the framework of IOC, the development of an agreement by which Member States make a commitment to increase their support for their oceanographic data centres, specifically to enable these to participate more effectively in international oceanographic data exchange.

C

Recognizing the need for a data expert to advise and assist RNODCs in developing their work on behalf of the Commission, and to assist in monitoring the flow of data through NODCs,

Requests Member States to consider seconding an expert to the Secretariat to take charge of monitoring and data-tracking activities, particularly to meet the requirements of the oceanographic components of the WCRP;

D

Noting with concern the delays in submitting data from Declared National Programmes (DNP) to the World Data Centres,

Wishing to encourage the submission of all relevant cruise data to the WDCs as swiftly as possible,

Realizing the importance of announcing National Oceanographic Programmes (NOPs) well in advance of their implementation and of the timely submission of ROSCOP forms to the IODE System,

Realizing also that there exists duplication of information between the ROSCOP form and the DNP announcement, and that the declaration of data availability for international exchange may not be implemented owing to procedural problems resulting from changes in cruise plans or experiments that do not produce the expected results, Supports the decision of the Working Committee on IODE to discontinue the DNP Announcement and to keep in force only one type of advance notification entitled NOP Announcement;

Instructs the Secretary to update the brochure on DNP/NOP Announcements and all relevant IOC Manuals and Guides accordingly;

Also instructs the Secretary to mobilize financial support for an electronic bulletin board for NOP Announcements, continuing, however, the practice of distributing hard-copy NOP Announcements, until all Member States have access to an electronic bulletin board;

E

Noting the increasing interest in marine scientific informtion as a basic requirement for scientific and technical research, as well as a basis for planning and management of national and regional marine scientific and technical projects,

Recognizing the potential value of regional marine scientific information exchange for the development of marine infrastructure in developing countries,

Noting with appreciation the close collaboration on marine information management between the Commission and FAO and UN(OETB) in the context of the Aquatic Science and Fisheries Information System, and with other Organizations members of ICSPRO, and UNEP, on selected subjects,

Recalling also the decision of the Executive Council, at its Nineteenth Session, on the Guidelines for the Structure and Responsibilities of the Subsidiary Bodies of the Commission,

Decides to change the name of the Working Committee on International Oceanographic Data Exchange to the Technical Committee on International Oceanographic Data and Information Exchange, retaining the acronym IODE.

Financial implications: Foreseen in Draft 24 C/5 (partly); voluntary contributions (partly).

Resolution XIV-9

MARINE INFORMATION MANAGEMENT

The Intergovernmental Oceanographic Commission,

Recalling Resolution XIII-9 and the view, expressed at the Thirteenth Session of the Assembly, that, for marine science programmes to be effective, scientists must have access to adequate information facilities, Further recalling the longstanding and effective collaboration between the Commission, FAO and the UN(OETB) as co-sponsors of ASFIS,

Having considered marine information management aspects of the Report and Recommendations of the Twelfth Session of the Technical Committee on International Oceanographic Data Exchange,

Recognizing that, to enable the Commission to maintain its role in this expanding field and progressively to assume responsibility for the operation of certain ASFIS information registers, the staff and financial resources of the Commission need to be increased, as recommended by ICSPRO,

Noting the importance of reinforcing collaboration and co-ordination among all bodies active in this field, and in particular with the co-sponsors of ASFIS, other organizations members of ICSPRO, and UNEP,

Realizing that a clear strategy for the marine information management endeavours of the Commission is essential, especially in view of the interest expressed by Member States in establishing national and regional marine information networks,

Decides that this strategy should include the strengthening of the ASFIS system to improve the availability of the information to all Member States and the exploitation of current information technology, to ensure effective, economic and flexible production of the ASFIS registers;

Instructs the Secretary to convene an ad hoc consultation of experts to prepare the strategy;

Invites FAO and the UN, through its Ocean Economics and Technology Branch, to co-sponsor the Group of Experts on Marine Information Management;

Urges Member States and concerned international organizations to support the endeavours of the Commisssion in the field of marine information management through the provision of funding, seconded staff or other forms of support.

Financial implications: Foreseen in Draft 24 C/5 (partly); voluntary contributions (partly).

Resolution XIV-10

WORK OF THE IOC SUB-COMMISSION FOR THE CARIBBEAN AND ADJACENT REGIONS (IOCARIBE)

The Intergovernmental Oceanographic Commission,

Accepts the Summary Report and Recommendations of the Second Session of the Sub-Commission for IOCARIBE;

Establishes: (i) an IOCARIBE Group of Experts on Physical Oceanography and Climate, to implement Recommendation SC-IOCARIBE-II.1; (ii) an IOCARIBE Group of Experts on Marine Pollution Research and Monitoring, to follow up Recommendation SC-IOCARIBE-II.2; (iii) an IOCARIBE Group of Experts on Recruitment in Tropical Coastal Demersal Communities, to follow up Recommendation SC-IOCARIBE-II.3;

Invites UNEP and FAO to co-sponsor the Groups of Experts mentioned in (ii) and (iii), respectively;

Instructs the Secretary to examine the possibility of establishing an IOCARIBE Group of Experts on Phytoplankton Blooms, Red Tides and Associated Kills of Marine Organisms to replace the existing ad hoc Fish Kill Steering Committee, as indicated in Recommendation SC-IOCARIBE-II.4, and to report to the Executive Council at its Twenty-first Session.

Financial implications: Foreseen in Draft 24 C/5 (partly); voluntary contributions (partly).

Annex 1 to Resolution XIV-10

TERMS OF REFERENCE OF THE IOCARIBE
IOC-IMO-UNEP GROUP OF EXPERTS ON PHYSICAL OCEANOGRAPHY AND CLIMATE[1]

The IOCARIBE Group of Experts on Physical Oceanography and Climate in the Caribbean and Adjacent Regions shall:

1. BASIC FUNCTION

Assist the IOC Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE) in implementing the recommendations of the IOCARIBE Workshop on Physical Oceanography and Climate (Cartagena, Colombia, 19-22 August 1986); in particular, to assist in establishing an improved network of stations each to record sea level, sea-surface temperature and salinity, wave spectra, wind velocity, barometric pressure, precipitation, insolation and relative humidity, and in organizing workshops and expert consultations with a view to providing Member States with equipment, training and spare parts.

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[1] These Terms of Reference have been drafted in the light of the Guidelines on the Structure and Responsibilities of the Subsidiary Bodies of the Commission approved by the IOC Executive Council at its Nineteenth Session.

2. PROGRAMME DEVELOPMENT

2.1 PLANNING

Prepare a detailed plan of action for carrying out the projects and activities adopted or approved by the Sub-Commission for IOCARIBE in this field.

2.2 PROMOTION

Assist in the promotion, in the Member States of the Sub-Commission for IOCARIBE and in their marine scientific communities, of the agreed projects or activities.

2.3 CO-ORDINATION

Identify the participating entities (institutions, individual scientists, as the case may be), inform them of the actions each is expected to undertake in the implementation of the agreed projects and activities, and generally inform each participating entity of the actions being taken by the other participating entities, so as to avoid unnecessary duplication of effort.

2.4 SCIENTIFIC AND TECHNICAL ADVICE

Advise the Sub-Commission for IOCARIBE on the methods and procedures to be preferred in carrying out the work relating to the agreed projects and activities.

Advise the participating entities, as appropriate, of such methods and procedures, and on any methodological question falling within the Group of Experts' sphere of competence.

Advise the Sub-Commission on the requirements for Training, Education and Mutual Assistance in the Marine Sciences (TEMA) relative to the Group's sphere of activity.

2.5 COLLABORATION

Collaborate with the IOC Technical Committee on Ocean Processes and Climate and the Joint SCOR-IOC Committee on Climatic Changes and the Oceans in the implementation of relevant activities in the field of physical oceanography and climate, and, when appropriate, with similar expert groups active in this field.

2.6 EVALUATION

Evaluate progress in the implementation of agreed projects and activities with a view to proposing new approaches or new directions in the light of results achieved.

3. OTHER FUNCTIONS

3.1 TECHNICAL POLICY

Advise the Sub-Commission for IOCARIBE on the technical requirements for the effective implementation of agreed projects and activities and for the achievement of the Sub-Commission's objectives in this field.

3.2 REPORTING

Report to the Sub-Commission for IOCARIBE, at each Session of the Sub-Commission, on the scientific and technical aspects of its activities.

Annex 2 to Resolution XIV-10

TERMS OF REFERENCE OF THE IOCARIBE GROUP OF EXPERTS ON MARINE POLLUTION RESEARCH AND MONITORING IN THE CARIBBEAN

The IOCARIBE Group of Experts on Marine Pollution Research and Monitoring in the Caribbean shall:

1. BASIC FUNCTION

Propose to the IOC Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE) projects or activities to develop regional components of the IOC Programme for the Global Investigation of Pollution in the Marine Environment (GIPME) and of the related Marine Pollution Monitoring System (MARPOLMON); address specific marine pollution problems in the Caribbean and adjacent areas; formulate proposals for marine pollution research and monitoring contributing to the declared goals of the Caribbean Action Plan (CAP) of the UN Environment Programme (UNEP).

2. PROGRAMME DEVELOPMENT

2.1 PLANNING

Prepare a detailed plan of action for carrying out the projects and activities adopted or approved by the Sub-Commission for IOCARIBE in this field.

2.2 PROMOTION

Assist in the promotion, in the Member States of the Sub-Commission for IOCARIBE and in their marine scientific communities, of the agreed projects or activities.

2.3 CO-ORDINATION

Identify the participating entities (institutions, individual scientists, as the case may be), inform them of the actions each is expected to undertake in the implementation of the agreed projects and activities, and generally inform each participating entity of the actions being taken by the other participating entities, so as to avoid unnecessary duplication of effort.

2.4 SCIENTIFIC AND TECHNICAL ADVICE

(a) Advise the Sub-Commission for IOCARIBE on the methods, procedures and operations to be preferred in carrying out the work relating to the agreed projects and activities.

(b) Undertake specific tasks (e.g., prepare scientific and technical reports, reviews, guidelines), if appropriate, to help ensure optimum implementation of the agreed programmes, projects or activities; in particular, keep under review the relationships, if any, between marine pollution and episodic phenomena, such as sudden mortalities of fish and other marine organisms in the region.

2.5 COLLABORATION

Collaborate, as appropriate, with other organisms, such as subsidiary bodies of the Commission or of other international organizations, whether governmental or non-governmental, global or regional, at an equivalent hierarchical level, as decided by the Sub-Commission for IOCARIBE; in particular, co-operate with the GIPME Group of Experts on Effects of Pollutants (GEEP); and interact with the UNEP Regional Co-ordinating Unit (RCU) for the Caribbean Action Plan (CAP) in the promotion, adoption and co-ordination of those sections of the Plan pertinent to the interests of the Sub-Commission.

3. OTHER FUNCTIONS

3.1 REPORTING

Report to the Sub-Commission for IOCARIBE at intervals to be decided by the Sub-Commission; in the event that a session of the Scientific Committee for GIPME precedes an ordinary session of the Sub-Commission for IOCARIBE by three months or more, report on its activities to the Scientific Committee for GIPME first and the Sub-Commission for IOCARIBE second.

Annex 3 to Resolution XIV-10

TERMS OF REFERENCE OF THE IOCARIBE GROUP OF EXPERTS ON RECRUITMENT IN TROPICAL COASTAL DEMERSAL COMMUNITIES IN THE CARIBBEAN AND ADJACENT REGIONS[1]

The IOCARIBE Group of Experts on Recruitment in Tropical Coastal Demersal Communities in the Caribbean and Adjacent Regions shall:

1. BASIC FUNCTION

Assist the Sub-Commission for IOCARIBE in: the implementation of the Recommendations of the IOC-FAO Workshop on Recruitment in Tropical Coastal Demersal Communities (IOC Workshop Report Nº 44) in the IOCARIBE region; the organization of projects and scientific development in general.

2. PROGRAMME DEVELOPMENT

2.1 PLANNING

Prepare a detailed plan of action for carrying out the projects and activities adopted or approved by the Sub-Commission for IOCARIBE in this field.

2.2 PROMOTION

Assist in the promotion, in the Member States of the Sub-Commission for IOCARIBE and in their marine scientific communities, of the agreed projects or activities.

2.3 CO-ORDINATION

Identify the participating entities (institutions, individual scientists, as the case may be), inform them of the actions each is expected to undertake in the implementation of the agreed projects and activities, and generally inform each participating entity of the actions being taken by the other participating entities, so as to avoid unnecessary duplication of effort.

2.4 SCIENTIFIC AND TECHNICAL ADVICE

Advise the Sub-Commission for IOCARIBE on the methods and procedures to be preferred in carrying out the work relating to the agreed projects and activities.

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[1] These Terms of Reference have been drafted in the light of the Guidelines on the Structure and Responsibilities of the Subsidiary Bodies of the Commission approved by the IOC Executive Council at its Nineteenth Session.

Advise the participating entities, as appropriate, of such methods and procedures, and on any methodological question falling within the Group of Experts' sphere of competence.

Advise the Sub-Commission for IOCARIBE on the requirements for Training, Education and Mutual Assistance in the Marine Sciences (TEMA) relative to the Group's sphere of activity.

2.5 COLLABORATION

Collaborate with the IOC-FAO Guiding Group of Experts on Ocean Science in Relation to Living Resources in the implementation of relevant activities in the field of recruitment in tropical demersal communities, and, when appropriate, with similar expert groups active in this field.

2.6 EVALUATION

Evaluate progress in the implementation of agreed projects and activities with a view to proposing new approaches or new directions in the light of results achieved.

3. OTHER FUNCTIONS

3.1 TECHNICAL POLICY

Advise the Sub-Commission for IOCARIBE on the technical requirements for the effective implementation of agreed projects and activities and for the achievement of the Sub-Commission's objectives in this field.

3.2 REPORTING

Report to the Sub-Commission for IOCARIBE, at each Session of the Sub-Commission, on the scientific and technical aspects of its activities.

Resolution XIV-11

WORK OF THE IOC REGIONAL COMMITTEE FOR THE CENTRAL EASTERN ATLANTIC (IOCEA)

The Intergovernmental Oceanographic Commission,

Believing that the fruitful First Session of the IOC Regional Committee for the Central Eastern Atlantic marks a major step forward in international co-operation in marine sciences and the related ocean services in this region,

Accepts the Summary Report and Recommendations of the First Session of the Regional Committee;

Establishes: (i) an IOCEA Group of Experts on Ocean Science in Relation to Living Resources in the Central Eastern Atlantic, with the Terms of

Reference given in the Annex 1 to the present Resolution; (ii) an IOCEA Group of Experts on Ocean Science in Relation to Non-Living Resources in the Central Eastern Atlantic, with the Terms of Reference in the Annex 2 to the present Resolution;

Notes the establishment by the Regional Committee of a Task Team on the IOCEA Component of the Global Sea-level Observing System;

Encourages the Regional Committee to develop co-operation, as appropriate, with the relevant regional bodies and complementary programmes of other international organizations.

Financial implications: Foreseen in Draft 24 C/5 (partly); voluntary contributions (partly).

Annex 1 to Resolution XIV-11

TERMS OF REFERENCE OF THE GROUP OF EXPERTS ON OCEAN SCIENCE IN RELATION TO LIVING RESOURCES IN THE CENTRAL EASTERN ATLANTIC[1]

The Group of Experts on Ocean Science in Relation to Living Resources in the Central Eastern Atlantic shall:

1. BASIC FUNCTION

Assist the IOC Regional Committee for the Central Eastern Atlantic in the implementation of co-operative regional and/or sub-regional studies in the framework of the IOC-FAO Programme of Ocean Science in Relation to Living Resources.

2. PROGRAMME DEVELOPMENT

2.1 PLANNING

Prepare a detailed plan of action for carrying out the projects and activities adopted or approved by the Regional Committee for IOCEA in this field.

2.2 PROMOTION

Promote in the Member States of the IOC Regional Committee for IOCEA and in their marine scientific communities the agreed projects or activities.

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[1] These Terms of Reference have been drafted in the light of the Guidelines on the Structure and Responsibilities of the Subsidiary Bodies of the Commission approved by the IOC Executive Council at its Nineteenth Session.

2.3 CO-ORDINATION

Identify the participating entities (institutions, individual scientists, as the case may be), inform them of the actions each is expected to undertake in the implementation of the agreed projects and activities, and generally inform each participating entity of the actions being taken by the other participating entities, so as to avoid unnecessary duplication of effort.

2.4 SCIENTIFIC AND TECHNICAL ADVICE

Advise the Regional Committee on the methods and procedures to be preferred in carrying out the work relating to the agreed projects and activities.

Advise the participating entities, as appropriate, of such methods and procedures, and on any methodological question falling within the Group of Experts' sphere of competence.

Advise the Regional Committee on the requirements for Training, Education and Mutual Assistance in the Marine Sciences (TEMA) relative to OSLR in the region.

2.5 COLLLABORATION

Collaborate with the IOC-FAO Guiding Groups of Experts on OSLR, in the implementation of activities relevant to OSLR in the region, and, when appropriate, with similar expert groups active in the field of cean science in relation to living resources.

2.6 EVALUATION

Evaluate progress in the implementation of agreed projects and activities with a view to proposing new approaches or new directions in the light of results achieved.

3. OTHER FUNCTIONS

3.1 TECHNICAL POLICY

Advise the Regional Committee for the Central Eastern Atlantic on the technical requirements for the effective implementation of agreed projects and activities and for the achievement of the Regional Committee's objectives in this field.

3.2 REPORTING

Report to the Regional Committee for the Central Eastern Atlantic at each Session of the Committee, and to the IOC-FAO Guiding Group of Experts on OSLR, on the scientific and technical aspects of its activities.

Annex 2 to Resolution XIV-11

TERMS OF REFERENCE OF THE GROUP OF EXPERTS ON OCEAN SCIENCE IN RELATION TO NON-LIVING RESOURCES IN THE CENTRAL EASTERN ATLANTIC[1]

The Group of Experts on Ocean Science in Relation to Non-Living Resources in the Central Eastern Atlantic shall:

1. BASIC FUNCTION

Assist the IOC Regional Committee for the Central Eastern Atlantic in the implementation of co-operative regional and/or sub-regional studies in the framework of the IOC-UN(OETB) Programme on Ocean Science in Relation to Non-Living Resources.

2. PROGRAMME DEVELOPMENT

2.1 PLANNING

Prepare a detailed plan of action for carrying out the projects and activities adopted or approved by the Regional Committee for IOCEA in this field.

2.2 PROMOTION

Promote in the Member States of the IOC Regional Committee for IOCEA and in their marine scientific communities the agreed projects or activities.

2.3 CO-ORDINATION

Identify the participating entities (institutions, individual scientists, as the case may be), inform them of the actions each is expected to undertake in the implementation of the agreed projects and activities, and generally inform each participating entity of the actions being taken by the other participating entities, so as to avoid unnecessary duplication of effort.

2.4 SCIENTIFIC AND TECHNICAL ADVICE

Advise the Regional Committee on the methods and procedures to be preferred in carrying out the work relating to the agreed projects and activities.

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[1] These Terms of Reference have been drafted in the light of the Guidelines on the Structure and Responsibilities of the Subsidiary Bodies of the Commission approved by the IOC Executive Council at its Nineteenth Session.

Advise the participating entities, as appropriate, of such methods and procedures, and on any methodological question falling within the Group of Experts' sphere of competence.

Advise the Regional Committee on the requirements for Training, Education and Mutual Assistance in the Marine Sciences (TEMA) relative to OSNLR in the region.

2.5 COLLABORATION

Collaborate with the IOC-UN(OETB) Guiding Groups of Experts on OSNLR, in the implementation of activities relevant to OSNLR in the region, and, when appropriate, with similar expert groups active in the field of ocean science in relation to non-living resources.

2.6 EVALUATION

Evaluate progress in the implementation of agreed projects and activities with a view to proposing new approaches or new directions in the light of results achieved.

3. OTHER FUNCTIONS

3.1 TECHNICAL POLICY

Advise the Regional Committee for the Central Eastern Atlantic on the technical requirements for the effective implementation of agreed projects and activities and for the achievement of the Regional Committee's objectives in this field.

3.2 REPORTING

Report to the Regional Committee for the Central Eastern Atlantic at each Session of the Committee, and to the IOC-UN(OETB) Guiding Group of Experts on OSNLR, on the scientific and technical aspects of its activities.

Resolution XIV-12

REGIONAL STUDY OF THE PHENOMENON KNOWN AS "EL NINO"

The Intergovernmental Oceanographic Commission,

Recognizing that substantial progress has been made under the co-operative programme of research on "El Niño" (ERFEN), launched by the countries of the south-east Pacific in 1976 through the Comisiòn Permanente del Pacifico Sur (CPPS) and with the support of the IOC and WMO, and that a useful exchange of information has been initiated internationally, Recalling that the Assembly, at its Tenth Session, by Resolution X-2, set up a Joint IOC-WMO-CPPS Working Group on the Investigations of "El Niño", in recognition of the need for IOC Member States to maintain suitable co-ordination with respect to ERFEN and related research,

Considering that the 1982-83 El Niño event brought serious socio-economic effects to the countries in tropical and sub-tropical regions of the globe and demonstrated once again the need to improve and expand the programmes of observation and analysis especially by developing countries,

Emphasizing that improving the monitoring capacity of the ERFEN Programme will contribute to the World Climate Research Programme (WCRP) and its components, particularly the Tropical Oceans and Global Atmosphere Study (TOGA) and to the World Ocean Circulation Experiment (WOCE), as well as to the IOC-FAO Programme of Ocean Science in Relation to Living Resources (OSLR),

Recalling also that the Fifth Session of the Joint IOC-WMO-CPPS Working Group on the Investigations of El Niño recommended that Member States, in and outside the ERFEN region, give priority to improving the exchange of data, particularly in real- and near-real time through the GTS,

Urges the Member States of the Joint IOC-WMO-CPPS Working Group to negotiate, through their respective representatives to the international funding agencies, the allocation of funds for the ERFEN Programme;

Requests Member States in and outside the ERFEN region to give high priority to oceanographic and meteorological data exchange using IGOSS, GLOSS and IODE mechanisms;

Also urges Member States participating in WCRP and OSLR to provide resources through the IOC Trust Fund to enable the Commission to continue to support the ERFEN Programme and its TEMA component in particular;

Invites UNDP to reconsider and, if possible, provide increased funding for the proposal submitted for the "Monitoring and Prediction of the 'El Niño' Phenomenon in the South-East Pacific: Application to Development";

Instructs the Secretary of IOC, in consultation with the General Secretary of CCPS, to initiate negotiations, especially with bilateral funding agencies, to explore supplementary resources to finance components of the Project that are not covered through the UNDP contribution.

Financial implications: None.

Resolution XIV-13

JOINT OCEANOGRAPHIC ASSEMBLY - 1988

The Intergovernmental Oceanographic Commission,

Recalling Resolutions VII-2 and XI-38,

Also recalling the support and encouragement given to the scientific bodies concerned, including the Commission's advisory bodies, and in particular the Scientific Committee on Oceanic Research (SCOR), for the Joint Oceanographic Assembly held in Halifax in 1982, and the success of that Assembly,

Having received a report from SCOR on the steps being taken to organize the next Joint Oceanographic Assembly in Acapulco, Mexico, in August 1988,

Noting the decisions taken at the Twenty-fifth Session of the Inter-secretariat Committee on Scientific Programmes Relating to Oceanography (ICSPRO), Rome, 2-5 February 1987, in regard to: (i) possible funding support from the Member Organizations; and (ii) other organizational arrangements, including the reactivation of the JOA Logistics Committee,

Instructs the Secretary to co-operate with the scientific bodies concerned in preparations for the Assembly;

Approves, in support of JOA, the identification of $34 000 within the IOC Programme and Budget for 1988-89, as now found in the Unesco Draft 24 C/5;

Invites Member States, Unesco and other organizations of the United Nations System, members of ICSPRO, as well as other interested organizations and institutions, to assist in the mobilization of adequate funding support;

Requests the Secretary, pursuant to decisions of ICSPRO, in his capacity as Chairman of the Logistics Committee for JOA-88, to ensure the required co-ordination of Member Organizations in regard to preparations for, and support to, the Assembly;

Encourages IOC Member States to identify further funding for JOA-88, either through voluntary contributions to the IOC Trust Fund, or as direct in-kind support in the form of travel grants or other appropriate measures.

Financial implications: Foreseen in Draft 24 C/5.

Resolution XIV-14

REVISED TERMS OF REFERENCE FOR THE TECHNICAL COMMITTEE FOR TEMA AND STRENGTHENED CO-OPERATION WITH THE UNESCO DIVISION OF MARINE SCIENCES

The Intergovernmental Oceanographic Commission,

Recalling that, at its Thirteenth Session, it established a Study Group to advise on measures to strengthen co-ordination of the programme activities of the Unesco Division of Marine Sciences and the IOC, and to report to the Executive Council at its Nineteenth Session,

Noting Resolution EC-XIX.11, which invited the Study Group "to: (i) continue its work on improvements in co-operation and co-ordination between the Division of Marine Sciences and the IOC Secretariat; (ii) carry out an in-depth study on the ways and means of improving the functioning and reviewing terms of reference of the Working Committee[1] for Training, Education and Mutual Assistance in the Marine Sciences (TEMA) in co-operation with the Marine Sciences Division and with the Advisory Bodies of the Commission; and (iii) report to the Fourteenth Session of the Assembly on the best arrangements and further steps to be taken",

Having considered the conclusions and concrete proposals of the Study Group (Document IOC-XIV/11), particularly on ways and means to improve the work of the Technical Committee through, inter alia, joint servicing by the IOC Secretariat and the Division of Marine Sciences of the Sessions of the Committee, and appropriate follow-up in the areas where the Secretariats each have specific experience,

Taking the view that such arrangements will lead to accelerated implementation of the Unesco-IOC Comprehensive Plan, which is a major link between the programmes of the IOC and those of the Division of Marine Sciences,

Thanks the Study Group for its work;

Accepts the proposals set out in the Study Group's Report (Document IOC-XIV/11);

Approves the revised Terms of Reference for the Technical Committee for TEMA, attached as an Annex to the present Resolution;

Requests the Director-General of Unesco to authorize the Division of Marine Sciences to service, jointly with the Secretariat of the Commission, future sessions of the Technical Committee for TEMA.

Financial implications: None.

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[1] now Technical Committee, but former name in the quotation is retained here.

Annex to Resolution XIV-14

REVISED TERMS OF REFERENCE
OF THE IOC TECHNICAL COMMITTEE FOR TRAINING, EDUCATION AND MUTUAL ASSISTANCE IN THE MARINE SCIENCES

In order to build up national capabilities to participate fully in ocean research of interest to Member States, the IOC Technical Committee for Training, Education and Mutual Assistance in the Marine Sciences (TEMA), in close co-operation with UN organizations members of ICSPRO and other bodies concerned, shall:

(i) make recommendations to the IOC Governing Bodies and to Member States and, through the IOC, to Unesco for co-ordinated action to meet needs in training, education and mutual assistance in marine science and technology;

(ii) review progress on the implementation of the Unesco-IOC Comprehensive Plan for a Major Assistance Programme to Enhance the Marine Science Capabilities of Developing Countries, ensure its periodic updating, and advise on ways and means for its funding;

(iii) recommend programmes for training, education and mutual assistance which call for concerted action by Member States of Unesco and IOC;

(iv) give advice on arrangements for scientific and technical education, exchange of marine scientists, and the transfer of relevant technology and technical assistance to developing Member States in marine science aspects of ocean affairs;

(v) give advice to the IOC Governing Bodies and, through the IOC, to Unesco and other UN organizations members of ICSPRO, on:

  (a) development of human resources through the training of marine scientific and technical personnel;

  (b) development of the appropriate infrastructures for marine science programmes;

  (c) dissemination of information on education and training concerning marine science and technology;

(vi) report regularly and make recommendations to the Governing Bodies of IOC on the work accomplished and on future action required.

Resolution XIV-15

CO-OPERATION BETWEEN IOC AND UNEP IN MARINE POLLUTION RESEARCH AND MONITORING

The Intergovernmental Oceanographic Commission,

Recalling Resolution XII-20 on co-operation between IOC and UNEP in marine pollution research and monitoring, and Resolution XII-21 on the relationship between the IOC and UNEP,

Having been informed of the considerable development of this co-operation in recent years,

Noting the positive statements made at the Sixth Session of the Scientific Committee for GIPME on the increasing support of UNEP to the GIPME Programme, and Recommendation 4 of that Session, concerning closer co-operation between IOC and UNEP in this field,

Instructs the Secretary, in consultation with the Officers of the Scientific Committee for GIPME, to pursue the negotiations with UNEP;

Invites UNEP to co-sponsor the GIPME Programme and the Marine Pollution Monitoring System (MARPOLMON);

Also invites UNEP to co-sponsor regional Joint Groups of Experts on Marine Pollution Research and Monitoring composed of scientific and technical experts from the region concerned to formulate, promote and co-ordinate the implementation of selected projects falling within the mandates of the co-sponsoring organizations, working in close collaboration with the Scientific Committee for GIPME;

Urges Member States to pay attention to harmonizing their national positions with respect to IOC and UNEP, particularly at Sessions of the IOC Governing Bodies and the UNEP Governing Council.

Financial implications: Foreseen in Draft 24 C/5 (partly); voluntary contributions (partly); co-sponsorship implies cost-sharing.

Resolution XIV-16

THIRD UNESCO MEDIUM-TERM PLAN (1990-95)

The Intergovernmental Oceanographic Commission,

Having considered the Proposal on the IOC Contribution to the Third Unesco Draft Medium-Term Plan (1990-95), Recalling the positions taken by the IOC on the formulation of the Second Unesco Medium-Term Plan (1984-89) as found in Resolutions EC-XIV.1, EC-XV.2 and XII-10,

Further recalling the unique role of the IOC both as an intergovernmental body within Unesco and as a specialized mechanism for co-ordination of marine science activities and related aspects within the UN System through the ICSPRO Agreement,

Noting the steps taken by the Director-General of Unesco to consult with Member States and international governmental and non-governmental organizations, in order to obtain a wide breadth of views on formulation of the Third Medium-Term Plan, through a questionnaire that addresses a number of important issues that are of relevance to the future programmes of the Commission,

Emphasizes once again the need to ensure the appropriate financial resources, Secretariat staff and supporting services required to execute properly the programme of the Commission;

Notes also the possibility that structural adjustments may be made to the Plan;

Stresses the importance of the intergovernmental status of the Commission and of the maintainance of an integrated approach to the marine science programmes of Unesco, including those of the IOC and the Division of Marine Sciences, and the relevant marine-related components of other programmes;
Instructs the Secretary to proceed with the identification of the major anticipated trends in marine science and related ocean services, including the technological aspects thereof, acting on the advice of Member States, so as to provide the input of the Commission to the Third Medium-Term Plan;

Requests the Executive Council, at its Twenty-first Session, to consider the formulation of the marine component of the Third Medium-Term Plan and to offer appropriate guidance and advice;

Urges Member States to see that their national authorities are kept fully informed of the views of the Commission so as to ensure that such views are appropriately reflected in their national responses to the Director-General's questionnaire;

Invites the Director-General to take all these views into account when formulating proposals for the Third Medium-Term Plan.

Financial implications: None.

Resolution XIV-17

PROPOSAL ON THE IOC PROGRAMME OF WORK AND BUDGET FOR 1988-89

The Intergovernmental Oceanographic Commission,

A

Having considered the Proposal on the IOC Programme of Work and Budget for 1988-89, contained in Document IOC-XIV/8 Annex 5,

Noting that the proposal contains two components: (i) the IOC programmes within the Draft Unesco 24 C/5 (Programme X.4), and (ii) activities to be implemented through voluntary contributions to the IOC Trust Fund,

Accepts, as a basis for future planning, the Proposal for the IOC Programme and Budget for 1988-89.

B

Being aware that the funds foreseen in Programme X.4 (The Ocean and its Resources) of the Draft 24 C/5, while protecting the basic activities of the Commission, fall short, by a considerable margin, of the funding requirements during the coming biennium for the IOC Programme as a whole,

Realizing the desirability of increasing the financial resources of the Commission within the budget base of Unesco for 1988-89 when Programme X.4 is considered by the Twenty-fourth Session of the Unesco General Conference,

Expressing its concern that the personnel of the IOC Secretariat provided through Unesco continues to be insufficient,

Considers the component of the IOC Programme of Work and Budget contained in Programme X.4 of Draft 24 C/5 to be the minimal resources with which the Commission can ensure its basic activities;

Invites the Director-General to convey to the General Conference the foregoing views of the Commission;

Calls on Member States to muster all possible support for the Commission when Programme X.4 is considered by the General Conference of Unesco at its Twenty-fourth Session, in order to further strengthen the financial and staff resources of the IOC.

C

Noting the progress achieved by Member States in mobilizing voluntary contributions to the IOC Trust Fund, as urged by the Executive Council through Resolution EC-XIX.9, Acknowledges, with appreciation, advance indication by Member States of further voluntary contributions to the IOC Trust Fund;

Urges Member States to continue their efforts to mobilize, at an adequate level, funding for implementation of the IOC Programme of Work as a whole, through voluntary contributions to the IOC Trust Fund;

Authorizes the Secretary to implement progressively those activities found in Document IOC-XIV/8 Annex 5, as additional funding becomes available through voluntary contributions to the IOC Trust Fund and other sources, consulting, as required, the Officers of the Commission;

Invites the Chairman, in consultation with the First and Second Vice-Chairmen, with the assistance of the Secretary, to continue to exercise his good offices with Member States in regard to such voluntary contributions;

Instructs the Secretary to include in his Report to the Twenty-first Session of the Executive Council on the Programme of Work and Financial Requirements[1] information on the IOC Programme and Budget for 1988-89, as approved by the General Conference, and on the state of voluntary contributions to the IOC Trust Fund so that adjustments to planned programme implementation may be made, should the circumstances so require.

Financial implications: Voluntary contributions.

Resolution XIV-18

PROGRAMME AND BUDGET OF THE UNESCO DIVISION OF MARINE SCIENCES FOR 1988-89

The Intergovernmental Oceanographic Commission,

Recalling that, under Article 2 (h) of its Statutes, the Commission shall "make recommendations and provide technical guidance as to the formulation and execution of the marine science programmes of the United Nations Educational, Scientific and Cultural Organization",

Further recalling Resolution XIII-17 on the programme and budget of the Unesco Division of Marine Sciences, and Resolution EC-XIX.11 on strengthening the co-operation between the Division and the Commission,

Having reviewed the 1986-87 programme of the Division, which is planned and executed jointly with Unesco's Regional Offices of Science and Technology, and its draft programme and budget for 1988-89,

Noting the high proportion of the programme devoted to promoting the marine sciences in developing countries, the extensive co-operation with scientific non-governmental organizations, and the co-operative and complementary aspects of the programme relative to the IOC programmes, which make the programmes mutually supportive,

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[1] To be issued as Document IOC/EC-XXI/7

Recognizing the important contribution made by Unesco to strengthening national infrastructures in marine sciences,

Being convinced that accelerated implementation of the Unesco-IOC Comprehensive Plan for a Major Assistance Programme to Enhance the Marine Science Capabilities of Developing Countries requires full mobilization of the concerted efforts of the Division of Marine Sciences and the Commission within their respective assistance programmes,

Noting with concern the large reductions in the resources of the Division of Marine Sciences that occurred following withdrawal of three Member States from Unesco,

Invites Unesco to increase the resources allocated to the Division of Marine Sciences within the budget base of Unesco for 1988-89, with particular emphasis on activities to strengthen the marine science capabilities of developing countries, including specific training activities;

Expresses its appreciation to the Director General for making structural adjustments to the Draft 24 C/5 to clarify the draft programme of the Division for 1988-89, by combining the whole of it in Programme X.5 "Training and Research in Marine Science and Their Application to Coastal Management" and those of the IOC in Programme X.4 "The Ocean and its Resources".

Financial implications: None.

Resolution XIV-19

PROPOSED AMENDMENTS OF THE STATUTES OF THE COMMISSION

The Intergovernmental Oceanographic Commission,

Recalling

(i) the historic decision of Unesco to establish the Commission in 1960,

(ii) the increased use of the oceans and their resources, the great developments in marine science and technology, and particularly international co-operative marine science activities, since 1970, when the present Statutes of the Commission were amended, and then adopted, by the General Conference of Unesco,

(iii) the considerable growth in the number of IOC Member States, from 40 in 1961 to 115 in 1987, most of the newer Member States being developing countries,

(iv) the emergence of a new ocean regime, inspired by the UN Convention on the Law of the Sea, and reflected widely in national legislation and the practice of States,

(v) the increased demands of Member States on the Commission which have enhanced its role in the UN system and moulded its programmes accordingly, leading to the emergence of new areas of marine scientific endeavour, of ocean observing systems and ocean services, and

(vi) greatly increased requirements for the relevant training, education and mutual assistance in the marine sciences,

Having analysed carefully its Statutes in the light of these developments, through a Working Group on the Future Role and Functions of the Commission, in 1978,

Having considered the possible effects of amendments to the Statutes through a Task Team to Study the Implications, for the Commission, of the UN Conference on the Law of the Sea, and the New Ocean Regime, from 1980 to 1985,

Bearing in mind Resolution EC-XIX.8 (Amendments to the IOC Statutes),

Having also considered all proposals for amendments to its Statutes at the Fourteenth Session of the Assembly,

Approves the amendments contained in the Annex attached hereto;
Requests the General Conference of Unesco to amend the Commission's Statutes (Articles 1, 2, 3, 4, 5, 9 and 10) in accordance with the texts contained in the Annex attached hereto, pursuant to Article 13 of the present Statutes.

Financial implications: None.

Annex to Resolution XIV-19

AMENDMENTS TO THE IOC STATUTES,RECOMMENDED BY THE ASSEMBLY OF THE INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION TO THE GENERAL CONFERENCE OF UNESCO[1]

PROPOSED TEXT	PRESENT TEXT
ARTICLE 1	
PARAGRAPH 1	
"(a) The Intergovernmental Oceanographic Commission, hereafter called the Commission, is established as a body with functional autonomy within the United Nations Educational, Scientific and Cultural Organization.	"(a) The Intergovernmental Oceanographic Commission, hereafter called the Commission, is established within the United Nations Educational, Scientific and Cultural Organization."
(b) It guides the conception and follows the implementation of its programme as approved by the General Conference in the framework of the latter's adopted budget".	(none)
PARAGRAPH 2	
"The purpose of the Commission is to promote marine scientific investigations and related ocean services, with a view to learning more about the nature and resources of the oceans through the concerted action of its members."	"The purpose of the Commission is to promote scientific investigations with a view to learning more about the nature and resources of the oceans through the concerted action of its members."
PARAGRAPH 3	
(As in present Statutes)	

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[1] The underlined text is new with respect to the present text of the Statutes

ARTICLE 2

PARAGRAPH 1[1]

Sub-paragraph (a)

(As in present Statutes)

New sub-paragraph (b)

"(b) Develop, recommend and co-ordinate international programmes for scientific investigation of the oceans and related ocean services which call for concerted action by its members;"	"(b) Develop, recommend, and co-ordinate international programmes for scientific investigation of the oceans and related services which call for concerted action by its members;"

New sub-paragraph (c)

"(c) Develop, recommend and co-ordinate with interested international organizations, international programmes for scientific investigation of the oceans and related ocean services which call for concerted action with interested organizations;"	"(c) Develop, recommend and co-ordinate with interested international organizations, international programmes for scientific investigation of the oceans and related services which call for concerted action with interested organizations;"

New sub-paragraph (d)

(As in present Statutes)

New sub-paragraph (e)

(As in present Statutes)

New sub-paragraph (f)

"(f) promote and co-ordinate the development and transfer of marine science and its technology, particularly to developing countries."	(none)

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[1] Article 2 is the only Article in the present Statutes in which the paragraphs (three) were not numbered. The numbering was recommended by the IOC Assembly by consensus.

New sub-paragraph (g)	
"(g) make recommendations to strengthen education and training in marine science and its technology, and promote relevant projects in these fields as components of each of its programmes;"	"(f) make recommendations to strengthen education and training programmes in marine science and its technology;"
New sub-paragraph (h)	
(Sub-paragraph (g) of present Statutes).	
New sub-paragraph (i)	
(Sub-paragraph (h) of present Statutes).	
New sub-paragraph (j)	
"(j) promote scientific investigation of the oceans and application of the results thereof for the benefit of all mankind, and assist, on request, Member States wishing to co-operate to these ends. Activities undertaken under this sub-paragraph shall be subject, in accordance with international law, to the regime for marine scientific research in zones under national jurisdiction."	"(i) promote freedom of scientific investigation of the oceans for the benefits of all mankind, taking into account all interests and rights of coastal countries concerning scientific research in the zones under their jurisdiction."
New sub-paragraph (k)	
"(k) promote, plan and co-ordinate observing and monitoring systems, on the properties and quality of the marine environment, as well as the preparation and dissemination of processed oceanographic data and information, and of assessment studies."	(none)

New sub-paragraph (l)

"(l) promote, recommend and co-ordinate, with international organizations, as appropriate, the development of standards, reference materials and nomenclature for use in marine science and related ocean services."	(none)

New sub-paragraph (m)

"(m) undertake, as appropriate, any other action compatible with its purpose and functions concerning the scientific investigation of the ocean and its interfaces."	(none)

PARAGRAPH 2

"The Commission, in carrying out its functions, shall take into account the special needs and interests of developing countries, including in particular the need to further the capabilities of these countries in marine science and technology."	"In carrying out its functions, the Commission shall bear in mind the special needs and interests of developing countries, including in particular the need to further the capabilities of these countries in marine science and technology."

PARAGRAPH 3

"Nothing in this Article shall imply the adoption of a position by the Commission regarding the nature or extent of the jurisdiction of coastal States in general or of any coastal State in particular."	"Nothing in this Article shall be construed as implying the expression of a position regarding the nature or extent of the jurisdiction of coastal States in general or of any coastal State in particular."

ARTICLE 3

"1. The Commission shall give due attention to supporting the objectives of the international organizations with which it collaborates.	"The Commission shall give due attention to supporting the objectives of the international organizations with which it collaborates and which may request the Commission to act, as appropriate, as an instrument...[1]
On the other hand, the Commission may request these organizations to take its requirements into account in planning and executing their own programmes."	On the other hand, the Commission may request these organizations to take its requirements into account in planning and executing their own programmes.
"2. The Commission may act also as a joint specialized mechanism of the organizations of the United Nations system that have agreed to use the Commission for discharging certain of their responsibilities in the fields of marine science and ocean services, and have agreed accordingly to sustain the work of the Commission."	[1]... for discharging certain of their responsibilities in the field of marine science."

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[1] To facilitate the comparison of the Proposed and the Present Texts, the last part of the first sentence in the Present Text has been displaced (to follow the second sentence); the continuity is indicated by ...

ARTICLE 4

(Paragraph 1 of the present Statutes).	
(Paragraph 2 of the present Statutes).	
"3. Any Member State of the Commission may withdraw from it by giving notice of its intention to do so to the Director-General of Unesco. The date of such notice shall be that of its receipt by the Director-General. The notice shall take effect on the first day of the next ordinary session of the Assembly following the date of notice of withdrawal if the notice is given more than one year before the first day of said session; if the notice of withdrawal is given less than one year before the first day of the said session, it shall take effect one year after the date of notice of withdrawal."	"3. Any Member of the Commission may withdraw from it by giving notice of its intention to do so to the Director-General of the United Nations Educational, Scientific and Cultural Organization. Such notice shall take effect at the end of the first session of the Commission which follows the date on which notice has been given or, if notice has been given during the course of a session of the Commission, at the end of that session, unless withdrawn prior to that time."
(Paragraph 4 of the present Statutes).	
(Paragraph 5 of the present Statutes).	

ARTICLE 5

(Paragraph 1 of the present Statutes).

(Paragraph 2 of the present Statutes).

(Paragraph 3 of the present Statutes).

"4. During the course of each ordinary session, the Assembly, taking into account the principles of geographical distribution, shall elect:	"4. During the course of each ordinary session, the Assembly, taking into account the principles of geographical distribution shall elect:
(a) a Chairman and four Vice-Chairmen who shall be the officers of the Commission, its Assembly and its Executive Council;	(a) a Chairman and four Vice-Chairmen who shall be the officers of the Commission, its Assembly and its Executive Council;
(b) a number of Member States to the Executive Council, which number shall not exceed one quarter of the Member States of the Commission; each Member State so elected shall designate its representative on the Executive Council."	(b) Member States of the Commission who shall each designate a representative of that State to serve on the Executive Council; the number of Member States to be elected to the Executive Council shall be fixed by the Rules of Procedure. This number shall not exceed one-fourth the number of the members of the Commission."
(Paragraph 5 of the present Statutes).	
(Paragraph 6 of the present Statutes).	

ARTICLE 9

PARAGRAPH 1

"1. With due regard to the applicable Staff Regulations and Rules of the United Nations Educational, Scientific and Cultural Organization, the Secretariat of the Commission shall consist of a Secretary and such other staff as may be necessary, provided by the United Nations Educational, Scientific and Cultural Organization, as	"1. With due regard to the applicable Staff Regulations and Rules of the United Nations Educational, Scientific and Cultural Organization, the Secretariat of the Commission shall consist of personnel provided by the United Nations Educational, Scientific and Cultural Organization, as

well as such personnel as may be provided, at their expense, by the United Nations, the Food and Agriculture Organization of the United Nations, the World Meteorological Organization and the International Maritime Organization and other organizations of the United Nations system."	well as such personnel as may be provided, at their expense, by the United Nations, the Food and Agriculture Organization of the United Nations, the World Meteorological Organization and the Intergovernmental Maritime Consultative Organization, and other Organizations of the United Nations system."

PARAGRAPH 2

(As in present Statutes)

ARTICLE 10

PARAGRAPH 1

(As in present Statutes)

PARAGRAPH 2

"2. The expenditure of the Commission shall be financed from funds appropriated for this purpose by the General Conference of Unesco, from contributions by Member States of the Commission that are not Member States of Unesco, as well as from such additional resources as may be made available by other organizations of the United Nations system and by Member States, and from other sources."	"2. The expenditure of the Commission shall be financed from funds appropriated for this purpose by the General Conference of the United Nations Educational, Scientific and Cultural Organization as well as from such additional resources as may be made available by other organizations of the United Nations system and by Member States, and from other sources.

PARAGRAPH 3

(As in present Statutes)

Resolution XIV-20

MEASURES TO ENSURE ADEQUATE AND DEPENDABLE RESOURCES FOR THE COMMISSION'S PROGRAMME OF WORK

The Intergovernmental Oceanographic Commission,

Recalling Resolution XIII-13, by which the Assembly invited the Past Chairman of the Commission to arrange for the preparation of in-depth studies on, *inter alia*, measures to ensure the stability and continuity of the resources required for the implementation of the Commission's programme,

Further recalling that the Executive Council, at its Nineteenth Session, in commenting upon a first-stage study (Document IOC/EC-XIX/11), requested that the study be further developed by the First Vice-Chairman during the intersessional period,

Expressing its satisfaction with the work undertaken and the progress made in identifying the major outstanding issues that need to be dealt with in order to ensure adequate and dependable resources for the Commission's programme of work,

Noting further that the proposed amendments to the IOC Statutes are expected to clarify the context within which Member States contribute resources to the budget and work of the Commission,

Taking the view that further study is needed of the ways by which the required resources could be mobilized, as well as to related institutional arrangements,

Decides to establish an *ad hoc* Study Group composed of a small number of individuals familiar with the work of the Commission, with the Terms of Reference annexed hereto;

Requests the Study Group to prepare its Report, in close consultation with the Officers of the Commission, in time for advance distribution to Member States, so that the Report, together with a compilation of comments received, can be discussed as a substantive agenda item at the Twenty-first Session of the Executive Council.

Annex to Resolution XIV-20

TERMS OF REFERENCE OF THE AD HOC STUDY GROUP ON MEASURES TO ENSURE ADEQUATE AND DEPENDABLE RESOURCES FOR THE COMMISSION'S PROGRAMME OF WORK

The *ad hoc* Study Group, taking into account the views expressed by the Executive Council, at its Nineteenth Session and the Assembly, at its Fourteenth Session, shall undertake further study on:

(i) procedures and approaches required to identify budgetary requirements for timely and adequate implementation of the IOC programme, bearing in mind the need for advance information on the level of resources for purposes of approval and planning of the implementation of the programme;

(ii) how to define the responsibilities of Member States towards the Commission;

(iii) other ways and means to mobilize the required support for the Commission's programme, including institutional arrangements aimed at strengthening the capabilities of the Commission to carry out its functions;

(iv) any adjustments to Article 10 of the Statutes that might emerge from their deliberations and the identification of the modalities for the application of the said Article.

ANNEX III

ADDRESSES

A. Opening address by Prof. Inocencio Ronquillo Chairman of the Intergovernmental Oceanographic Commission (IOC)

Mr Director-General,
Mr Assistant Director-General for Science
Distinguished Delegates, Representatives and Observers
Ladies and Gentlemen

It is a special pleasure for me to address you at this Session of our Assembly.

We are particularly honoured once again by the presence of the Director-General of Unesco, Mr M'Bow, and I take this opportunity to express to you, Sir, my deep appreciation of the support and personal attention you have given to the affairs of the Commission in a period of especial difficulty for all.

These thanks must also be extended to the Assistant Director-General for Science, Mr. Kaddoura, who has admirably given effect to the Director-General's wishes for the advancement of the Commission's work.

This being my last Assembly as Chairman of the Commission, it is natural that I should briefly review the changes I have seen in the Commission's role and work since I was first elected in 1982. Experience has shown that global co-operation in marine science and ocean service programmes takes years, and sometimes a decade to achieve maturity: they must pass through the stages of planning, acceptance and active implementation. Many of the major programmes of the IOC have taken as long or longer, but are now well established.

In this context, I wish to recall that the ocean services of the Commission have been pioneers in their respective fields and are indeed unique in many respects; the development of the Global Sea-level Observing System is a demonstrative case. With the benefit of this experience, the ever-pressing demands of Member States for reliable prediction of natural events in the marine environment and their interaction with the atmosphere, the Commission's latest venture - Ocean Dynamics and Climate - is developing faster than the older programmes did. However, the programmes of Ocean Science in Relation to Living Resources, and in Relation to Non-living Resources, and Global Ocean Observing Systems, for example, are still mainly in the planning phase. The Commission's Ocean Services are entering a period of considerable acceleration, and some are approaching the operational level. All of them need to create roots at the regional level.

I was fortunate enough to have been actively associated as the Chairman of IOC in this exciting period, during which the Commission made considerable progress, with the firm support of Unesco, and your understanding of our problems, Mr. Director-General, and with the active participation of the Member States.

I wish now to refer to the efforts of the Commission, through its regional subsidiary bodies, as appropriate mechanisms for dealing with specific regional marine scientific problems, and in implementing regional components of the major global programmes. We had an excellent opportunity to appraise these significant advances when celebrating the 25th Anniversary of the Commission at the last session of our Assembly.

We have also seen in the last few years an increase in the level of co-operation between the Organizations members of ICSPRO and the Commission, leading towards the establishment of joint programmes and subsidiary bodies.

I sincerely hope that, in the near future, other UN organizations will seriously consider becoming parties to the ICSPRO Agreement under which the IOC's role as a joint specialized mechanism for assisting the members to discharge certain of their responsibilities in the field of marine science can be placed at the service of all the participating organizations of the UN system concerned with the oceans.

It would, of course, not be appropriate for me to overlook some of the problems with which the Commission has been faced. I think it is my duty to express frankly my analysis of the situation. Member States have increased their expectations and their demands of the Commission without a commensurate allocation of resources, whether through Regular Budget by way of the General Conference of Unesco or through contributions to the IOC Trust Fund, or through other appropriate arrangements. The Commission has undertaken, in the last few years, several longer-term multi-disciplinary scientific research programmes, which require longer-term commitments than ever before. Such commitments go well beyond even the UN system's Medium-term Plan schedule of six years, and are not at all compatible with the two-year programming and budget cycle. This uncertainty in resources seriously hampers the Commission's ability to undertake the obligations facing it - to Member States, to the other organizations with which it must and does collaborate, and to the international scientific community. This is a major challenge that Unesco and the Member States should face.

The budgetary constraints affecting Unesco, which have forced a serious reduction in the staff of the Commission's Secretariat, has brought upon the shoulders of this staff for some years now an extremely heavy workload which it has borne with a devotion and goodwill, and merits a special tribute. I wish to make a special reference to the sense of duty, the dynamic approach and enthusiasm of the Commission's Secretary. Even with the assistance of experts seconded to the Commission by the Member States and the staff provided by FAO and WMO under the ICSPRO Agreement, the personnel available to the Secretariat of the Commission does not cover at present some key marine scientific disciplines nor is it quantitatively adequate to provide the required servicing and technical backstopping of the approved programmes.

I should like to recall that the Commission's staff and resources are at about the same level as they were in 1980 whereas, the Commission's activities and the number of subsidiary bodies have increased considerably.

I note with satisfaction that the Member States are taking serious steps to improve liaison with the Commission as well as to improve co-operation at the national level in marine scientific affairs. I hope that this process continues, so as to facilitate the work of the Commission and the achievement of its objectives.

Allow me, on this occasion, Mr. Director-General, to appeal to you to help the Commission to overcome this particularly critical period and prepare itself to respond adequately to the growing demands of the Member States and of the world community, when a new century is approaching which will be marked by an increased use of the oceans and their resources. The Commission, as you know, has given considerable study to the need to amend its Statutes to reflect better its role and functions within Unesco so as to prepare it for the year 2000 and beyond, including ways and means of ensuring the stability and continuity of its resources.

To close, I should like to thank my fellow officers, and my predecessor, and, of course, the Member States and the Secretariat for their generous support in the conduct of the business of the Commission and of its Chairman, and to wish my successor and the future officers every success in what must surely be one of the most exciting periods of the Commission's history.

Thank you very much for your kind attention.

B. Address by Mr Amadou-Mahtar M'Bow Director-General of the United Nations Educational, Scientific and Cultural Organization (Unesco)

Mr Chairman,
Honourable Vice-Chairmen,
Mr Representative of the Secretary-General of the United Nations,
Ladies and Gentlemen,

It gives me great pleasure to welcome you to Unesco House on the occasion of this, the Fourteenth Session of the Assembly of the Intergovernmental Oceanographic Commission.

All Unesco's undertakings since its inception in the field of the marine sciences have shown its unflagging determination to help to strengthen international scientific co-operation and progress in its Member States.

As you know, as early as 1955 an International Advisory Committee on Marine Sciences (IACOMS) was established to advise the Director-General on all matters concerned with the development of international co-operation in this field. Two years later the International Council of Scientific Unions, ICSU, in turn set up a special committee, which has become the Scientific Committee on Oceanic Research, SCOR.

We can claim that the Intergovernmental Oceanographic Commission grew out of the close co-operation which developed between the two

Committees with the assistance in particular of the United Nations, the Food and Agriculture Organization of the United Nations, the World Meteorological Organization and the International Atomic Energy Agency, and I wish to pay tribute to these bodies for their invaluable collaboration.

As the purpose assigned to the IOC is `to promote scientific investigation with a view to learning more about the nature and resources of the ocean through the concerted action of its members', only 40 States considered themselves to be in a position to join it at the end of its first session. These were countries which had relatively substantial resources at their disposal and were already giving a high degree of priority to oceanographic activities.

Today, the IOC has 115 Member States. Measures taken within Unesco have done much to encourage this development. While providing the IOC with its Secretariat and helping to diversify and strengthen its activities, Unesco has also made special efforts to enhance the co-operation of all its Member States, in the context of programmes prepared and implemented in the Division of Marine Sciences, in correlation with the work of the Commission.

A number of countries have thus gradually come to benefit from international co-operation, which has enabled them to promote the development of marine sciences and to increase their training and research capacities. Thus it was only natural that they should decide, in their turn, to join the IOC.

If it was a bold experiment to create the IOC, that experiment, has in my view, fulfilled its promise. What was once the embryo of an intergovernmental body, serving a limited purpose, has now developed into an efficient, soundly structured mechanism which pays a key role in the United Nations system and contributes to the co-ordination of the Inter-Secretariat Committee on Scientific Programmes Relating to Oceanography.

Mr Chairman, you listed just now the main activities of the IOC and some of its subsequent lines of emphasis, and I do not therefore think it necessary to mention them again. But the importance of international oceanographic co-operation is such that, as you rightly emphasized, it warrants the allocation of more substantial resources. But you are aware- and I will not dwell on this - of the circumstances in which the Organization has had to reduce its budget and, consequently, its staff. All areas of Unesco's programme have been affected in this way. But the Organization has succeeded, through more rigorous management, in limiting the effects of that reduction.

The Member States lent it invaluable assistance in this task - by seconding staff, by offering voluntary contributions and by supporting its programmes more strongly. Unesco has thus, particularly through the IOC, confirmed its dynamic outlook and its confidence in the future.

I have already had several opportunities to discuss matters concerning the IOC within Unesco with your Chairman, your former Chairman and your first Vice-Chairman.

The discussion on the programme and the means of implementing it, during the twenty-third session of the General Conference and at the last two sessions of the Executive Board, have demonstrated the importance of the oceanography programmes of Unesco and of its Intergovernmental Oceanographic Commission.

The Organization intends to continue its action in this field with determination, although of course it must work with the resources available to it. The draft budget for 1988-1989 that will be submitted to the General Conference at the end of this year bears ample witness to this. But I must also add that, on account of the decision taken by the Member States to keep the Organization's budget at the zero growth level, it has not been possible to make more specific efforts for the IOC. But Mr Chairman, ladies and gentlemen, I wish to tell you that I am personally prepared to support at the General Conference any proposal that this General Assembly may make to increase the Organization's resources, in particular by exceeding the limit of zero growth. Mr Chairman, you have stressed the importance of the marine sciences today. One cannot both call for a strengthening of these activities and withhold the means of achieving it. You are the spokesmen of the majority of Member States, and it is entirely up to the Member States to take a positive decision in this regard. The Director-General and the Secretariat of the Organization are prepared to support any representations that you may wish to make to all Member States. In addition, naturally, to the Programme and Budget for 1988-1989, we must start to map out the broad lines of the third Medium-Term Plan which will cover the period 1990-1995.

Strong emphasis should be laid on the role of the ocean in this plan and I shall be happy to hear your views on the subject.

Unesco and its Intergovernmental Oceanographic Commission intend to continue to promote the progress of scientific knowledge that is needed by all who are working to extract rationally from the sea the manifold resources that it holds in its depths and to protect it efficiently from the dangers that threaten it. Similarly, it is necessary to provide all users of the sea with ever more sophisticated and more diversified ocean services. The needs that you express in this regard will naturally be taken into consideration and treated in the preparation of the Organization's programmes with all the attention that they deserve - again, of course, within the limits of the funds available.

An essential ingredient in the implementation of Unesco's programmes is consistency between the programmes executed in the framework of the IOC and those under the responsibility of the Division of Marine Sciences. In accordance with the wishes expressed at the last session of the General Conference a joint effort has been made to clarify interconnections between programmes and to improve the co-ordination of activities.

This effort, inspired by a concern for overall consistency, will continue. It will focus in particular on the implementation of the Comprehensive Plan for a Major Assistance Programme to Enhance the Marine Science Capabilities of Developing Countries. The States have received this plan very favorably. They now wish to see it taking shape more vigorously. This is one of the priority tasks to which Unesco must attend in the years ahead.

To conclude, I should like to extend a special salutation to your Chairman, Professor Inocencio Ronquillo, and to your First Vice-Chairman, Miss Marie-Annic Martin-Sané. Indeed, I wish to express our heartfelt gratitude to them. Both are ending their second term of office at this session, after unstintingly pouring all their energies into the work of international oceanographic co-operation.

I can vouch for the fact that they have made themselves its ardent and effective champions wherever it has been a subject of debate and wherever there has been a need to plead its cause. Both, I believe, have fully deserved our gratitude, as, likewise, they have won our esteem and our friendship.

Ladies and Gentlemen,

It remains only for me to wish you every success in your work. Thank you.

C. Address by Mr. Satya N. Nandan, Under-Secretary-General, special Representative of the Secretary-General of the United Nations for the Law of the Sea

Mr. Chairman,

It gives me great pleasure to have the opportunity to address the Fourteenth Session of your Assembly.

While the United Nations Secretariat has for years maintained a very close and fruitful working relationship with your Commission and while mutual participation in meetings relating to common interest has been a permanent feature of our co-operation, it is the first time that I have personally had the opportunity to be present in Paris at the time of your meeting.

I particularly welcome this in view of the significant progress which has been made in the acceptance by the international community of the new regime of the ocean and the importance of the challenges which confront the organizations and bodies of the United Nations system in assisting States to implement the provisions of the Convention on the Law of the Sea.

The 1982 Convention on the Law of the Sea was heralded as a landmark achievement of the international community. The Convention not only establishes the legal framework for all activities in the marine environment but also represents one of the most important conflict-prevention measures adopted by the international community, since it establishes clearly for States the extent and nature of their rights and obligations in the various maritime zones. It also provides a unique procedure for the settlement of disputes which may arise from the application or interpretation of the various provisions of the Convention.

The Convention, being a comprehensive instrument, covers all uses and resources of the seas. It integrates within it the regimes that would apply to navigation, marine transportation and communication, exploitation of both living and non-living resources, the prevention of marine pollution, marine science and technology and the settlement of disputes. In its preamble the Convention recognizes that all activities in the ocean space are interrelated. This is only logical since activities of one kind in the marine environment impact on other activities in the same environment. The recognition of this fact calls for an integrated system of ocean management on the part of States.

The overwhelming support given to the Convention by States from all regions is illustrated by the fact that at the closing date for signature there were 159 signatures - in itself a remarkable achievement. As of 1 March 1987 it had already received 32 ratifications. While the Convention will enter into force one year after the sixtieth instrument of ratification or accession has been deposited, we are already witnessing that States have begun to implement its provisions. Most States have adapted, or are in the process of, adapting their national legislation to reflect the provisions of the Convention.

The Convention is not only all-encompassing from the point of view of the substantive matters it covers, it also requires universal participation. It calls for co-operation in its implementation among all States and at all levels, whether bilateral, subregional, regional or global. Co-operation among States contributes not only to their economic development and the enhancement of the quality of life of their peoples, but also to the maintenance of peace and security among nations.

It is recognized that knowledge and information derived from marine scientific research play a key role in the successful management of the ocean. They are also a prerequisite for resource exploitation and control of marine pollution. This is particularly true for the proper management of the exclusive economic zone which is a new concept created under the Convention. This new concept extends the jurisdiction of States over the resources of the zone up to 200 nautical miles from their coasts. It is these areas of ocean space that more than 90 per cent of the living resources and all of the presently exploitable non-living resources of the oceans are to be found. Marine scientific research is therefore of particular importance to the development of the Exclusive Economic Zone.

The organizations and bodies within the United Nations system have a collective responsibility in matters relating to the oceans and each institution in its own field of competence has to fulfil part of this responsibility. The issue of marine scientific research is central to the mandate of the IOC and its importance cannot be over-emphasized.

Beyond its value as a means for mankind's understanding of the global environment it provides the necessary data and information on which the uses of the sea and its resources are based. It is with this awareness that Part XIII of the Convention dealing with marine scientific research was drafted and has now to be implemented. The centre-piece of these provisions is what is now called the "consent regime"; i.e., the need for the scientific community to obtain authorization from the coastal State whenever research activity in its exclusive economic zone or its continental shelf is envisaged.

Coastal States shall in normal circumstances grant their consent for marine scientific research projects to be carried out in accordance with the Convention exclusively for peaceful purposes and in order to increase scientific knowledge of the marine environment for the benefit of all mankind. Coastal States are also required to establish rules and procedures to ensure that such consent will not be delayed or denied unreasonably. However, provision is also made for the possibility of withholding such consent in certain specific circumstances. These are outlined in Article 246 of the Convention. Researching States or institutions are also obliged to provide relevant information to the coastal States and to comply with certain conditions including participation of personnel from the coastal State in any research project.

I am aware of cases where States have not always co-operated in giving the necessary consent to certain researching States or international scientific institutions. In some cases I believe that data or information resulting from the research activities have been interfered with. This reinforces my view that there is need for a point of reference to norms which have been generally agreed to on this and other matters relating to the Law of the Sea. These norms are to be found in the United Nations Convention on the Law of the Sea. It is a matter of great regret that these very positive achievements are not given due weight in the evaluation of the Convention and that excessive emphasis is given to one very narrow part of the Convention, namely its deep sea-bed mining provisions, where some difficulties may persist.

It is essential that recent State practice be studied in order that States should be assisted in the adoption of appropriate guidelines to facilitate the implementation of the consent regime. To this end, I am happy to be in a position to inform your Assembly that my Office is co-operating closely with the Secretariat of your Commission in order to address jointly this subject. This co-operation will lead to the convening of a First Workshop to analyse the practice of States and determine the major problems that exist at this time and those which may evolve in the future in this regard. It is envisaged that on the basis of the results of this first endeavour, a second meeting may be convened at United Nations Headquarters in New York to pursue work which ultimately should assist coastal States, as well as the scientific community at large, to implement the consent regime in a mutually beneficial manner for the coastal States and other States.

Additionally, in view of the overall responsibility of my Office for ensuring the coherent application of the Convention on the Law of the Sea and the specialized mandate of the IOC in marine scientific research, it has been agreed with the Secretariat of your Commission that close co-operation will be maintained in the publication of documents containing a compilation of all national legislation relating to marine scientific research.

Another area where we intend to co-operate closely relates to Part XIV of the Convention on the Law of the Sea dealing with the development and transfer of marine technology. Specifically, Section 3 of Part XIV of the Convention underlines the importance of the establishment of national and regional marine scientific research and technological centres. It is believed that this is an area where, again, our respective activities can complement each other for the greatest benefit of all States.

In conclusion, Mr. Chairman:

Let me reiterate how much I appreciate the opportunity to address this august Assembly and let me re-affirm to you and all Member States of the Commission, that the fundamental objective of the United Nations and the organizations within the system is to ensure a coherent approach to the implementation of the new regime and to provide assistance to all Member States in order for them to maximize the benefits to be derived from the ocean. We are very mindful of the fact that without a proper legal framework based on well-established and widely accepted norms, no activity in the ocean, be it marine scientific research or other uses, can take place in a secure and settled environment.

I thank you, Mr. Chairman.

ANNEX IV

A. LIST OF IOC MEMBER STATES

B. OFFICERS OF THE COMMISSION

C. STATE-MEMBER REPRESENTATIVES ON THE EXECUTIVE COUNCIL

(as from 2 April 1987)

A. LIST OF MEMBER STATES OF THE COMMISSION (115)
(as at 2 April 1987)

* ALGERIA
ANGOLA
* ARGENTINA
* AUSTRALIA
AUSTRIA
(THE) BAHAMAS
BANGLADESH
BARBADOS
BELGIUM
BENIN
* BRAZIL
* BULGARIA
CAMEROON
* CANADA
CAPE VERDE
CHILE
* CHINA
COLOMBIA
CONGO (the)
* COSTA RICA
* COTE D'IVOIRE
* CUBA
CYPRUS
DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA
* DENMARK
DOMINICAN REPUBLIC (the)
ECUADOR
* EGYPT
ETHIOPIA
FIJI
FINLAND
* FRANCE
GABON
GAMBIA
* GERMAN DEMOCRATIC REPUBLIC (the)
* GERMANY, FEDERAL REPUBLIC OF
GHANA
* GREECE
GUATEMALA
GUINEA
GUINEA-BISSAU
GUYANA
HAITI
ICELAND
* INDIA
* INDONESIA
IRAN, ISLAMIC REPUBLIC OF
* IRAQ
IRELAND
ISRAEL
* ITALY
JAMAICA
* JAPAN
JORDAN
* KENYA
KUWAIT
LEBANON
LIBYAN ARAB JAMAHIRIYA (the)
MADAGASCAR
MALAYSIA
MALTA
MAURITANIA
MAURITIUS
* MEXICO
MONACO
MOROCCO
MOZAMBIQUE
NETHERLANDS (the)
NEW ZEALAND
NICARAGUA
* NIGERIA
* NORWAY
OMAN
PAKISTAN
PANAMA
* PERU
* PHILIPPINES (the)
POLAND
PORTUGAL
QATAR
REPUBLIC OF KOREA (the)
ROMANIA
SAMOA
SAUDI ARABIA
* SENEGAL
SEYCHELLES
SIERRA LEONE
SINGAPORE
SOLOMON ISLANDS
SOMALIA
SOUTH AFRICA (suspended)
SPAIN
SRI LANKA
SUDAN (the)
SURINAME
SWEDEN
SWITZERLAND
SYRIAN ARAB REPUBLIC (the)
* THAILAND
TOGO
TONGA
TRINIDAD AND TOBAGO
TUNISIA
* TURKEY
UKRAINIAN SOVIET SOCIALIST REPUBLIC (the)
* UNION OF SOVIET SOCIALIST REPUBLICS (the)
UNITED ARAB EMIRATES (the)
* UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND (the)
UNITED REPUBLIC OF TANZANIA (the)
* UNITED STATES OF AMERICA (the)
URUGUAY
VENEZUELA
VIETNAM
YEMEN
YUGOSLAVIA

MEMBERS OF THE EXECUTIVE COUNCIL ARE INDICATED WITH AN ASTERISK *

B. OFFICERS OF THE COMMISSION
(as from 2 April 1987)

Chairman

Prof. Ulf Lie
Department of Marine Biology
University of Bergen
5065 Blomsterdalen
Norway

(Tel. (475) 226200

First Vice-Chairman

Prof. Manuel M. Murillo
Centro de Investigación en Ciencias
del Mar y Limnologia - CIMAR
Universidad de Costa Rica
San José
Costa Rica

(Tel. 24 37 10/24 92 94
Tlx: 2544 UNICORI)

Second Vice-Chairman

Prof. Alexander Yankov
Sofia State University
Bul. Rouski 15
Sofia 1000
Bulgaria

Tlx: SUKO 23296 BG)

Third Vice-Chairman

Mr. Samuel Allela
Director
Kenya Marine and Fisheries
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Fourth Vice-Chairman

Dr. Aprilani Seogiarto
Deputy Chairman
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Secretary

Dr. Mario Ruivo
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Tlg: Unesco Paris)
Tlm: IOC Secretariat

C. STATE-MEMBER REPRESENTATIVES ON THE EXECUTIVE COUNCIL
(as from 2 April 1987)

U. Lie	Norway (Chairman)
M. Murillo	Costa Rica (First Vice-Chairman)
A. Yankov	Bulgaria (Second Vice-Chairman)
S. Allela	Kenya (Third Vice-Chairman)
A. Soegiarto	Indonesia (Fourth Vice-Chairman)
A. Chouikhi	Algeria
S.R. Olivier	Argentina
D.G. Keeley	Australia
E. Ferraciu	Brazil
L.S. Parsons	Canada
Y. Hongmo	China
G.F. Zabi Soko	Côte d'Ivoire
G. Garcia Montero	Cuba
K.V. Hansen	Denmark
A.R. Bayoumi	Egypt
M.A. Martin-Sané	France
K. Voigt	German Democratic Republic
G. Hempel	Germany, Federal Republic of
C. Krimbas	Greece
S.Z. Qasim	India
N.A. Hussain	Iraq
B. Battaglia	Italy
T. Nemoto	Japan
A. Ayala-Castañares	Mexico
J.G. Tobor	Nigeria
J.M. Båkula	Peru
I.A. Ronquillo	Philippines
D.Y. Kane	Senegal
T. Pongsapipatt	Thailand
E. Izdar	Turkey
E. Tolstikov	USSR
D.P.D. Scott	UK
A.J. Calio	USA

ANNEX V

ANTON BRUUN MEMORIAL LECTURES 1987
(Abstracts)

Tuesday, 17 March 1987

REGIONAL CO-OPERATIVE MARINE SCIENCE

(Chairman: Mlle M.A. Martin-Sané, First Vice-Chairman, IOC)

Peter J. Cook (Australia)	Sea-level Changes, Environments, Tectonics, Marine Resources and Phosphorites
Michèle Fieux (France)	Monsoon and Currents in the Indian Ocean
Jorge E. Corredor (USA)	The Scientific Basis for the Assessment of Marine Pollution in the Caribbean Sea and Adjacent Regions: the CARIPOL Experience

SEA-LEVEL CHANGES, ENVIRONMENTS, TECTONICS, MARINE RESOURCES AND PHOSPHORITES

by Peter J. Cook
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and
Vice-Chairman, IOC-UN(OETB) Guiding Group of Experts
on Ocean Science in Relation to Non-Living Resources

The shallow marine realm, from the coastal zone to the outer shelf, contains important non-living resources. These are receiving increasing attention. In many parts of the world vast quantities of building material (sand, gravel, calcium, carbonate) are derived from offshore. Some placer deposits, particularly mineral sands, which are presently mined mainly from the onshore coastal zone, are being worked out, or "quarantined" because of environmental considerations, and consequently the attention of mineral sand explorers is moving offshore. Phosphorites (sedimentary phosphate deposits), our prime raw material for phosphatic fertilizers, are known to be an important offshore resource in a number of shelf areas. The coastal zone as a resource in its own right is one of our most precious commodities with much of the world's population living (and growing its food) in the onshore coastal zone.

The formation and preservation of all of these non-living resources depends on a complex interplay of sea-level fluctuations, environmental change and tectonic processes. These occur on a variety of time scales. Sea-level rises and falls range in magnitude from diurnal tidal changes to very major fluctuations of sea-level associated with the development of ice caps or the formation of mid-ocean ridges. Some of these changes may be sporadic and irregular, others may be regular manifestations of Milankovitch cycles. Environmental changes may be closely linked with climatic variations (and hence to sea-level change). However they can be associated with tectonism producing uplift or depression of the sea floor or changes to patterns of sedimentation or the type of sediment being deposited. In addition, we have evidence to suggest major changes of ocean chemistry during earth history which can profoundly affect the deposition of authigenic minerals on the sea floor. Not only can tectonic processes result in a relative rise or fall of sea level, they can also have a major effect on ocean circulation through the development of sea-ways, or the movement of continental fragments, and their attendant shelves, into new latitudes where new sedimentary assemblages will result.

Phosphorites, one of the important offshore mineral resources, provide an example of the way that all of these factors influence where and how major resources are formed on the sea floor. Processes involved include oceanic upwelling and high organic productivity, post-depositional processes within the sediment column, reworking of the phosphate grains, and so on. There is clearly a large number of factors operating over a range of scales which together are responsible for whether or not a phosphate deposit is formed at a particular place and time. Through by no means the only possible set of factors necessary to produce a small sedimentary phosphate deposit with, say, an area of around 10^2 km^2, spatial considerations and orders of magnitude could conceivably include: A low-latitude location ($\sim 10^7$ km^2) with aridity ($\sim 10^6$ km^2), oceanic upwelling ($\sim 10^6$ km^2), shallow water ($\sim 10^5$ km^2), a nearshore ($\sim 10^4$ km^2), structural or basement features ($\sim 10^3$ km^2), and the existence of coastal embayments or lagoons ($\sim 10^2$ km^2). In addition, there is a number of important temporal considerations including: the appropriate phase of plate tectonics (10^7 - 10^8 y), the global climate (10^7 - 10^8 y). enhanced oceanic circulation (10^4 - 10^8 y), and short-term sea-level changes (10^4 - 10^6 y). In fact few deposits would have formed in response to all of these factors, but the more these factors coincide in time and space, the more likely it is that a phosphate deposit will indeed be formed. Conversely, if few of these factors coincide a deposit may be less likely.

Within the western Pacific (WESTPAC) region, offshore phosphorites occur on submarine ridges and plateaux such as the Chatham Rise off New Zealand, on seamounts, for example in the vicinity of Fiji, and on continental margins, notably the east Australian margin. In addition there are some guyot and lagoonal deposits of the southwest Pacific which may represent subsided (or inundated) guano deposits. The deposits off eastern Australia are particularly interesting because this is one of only three areas in the world where phosphorites are known to be forming at the present day or in the very recent past. This is an area that will be intensively studied using a range of geological, geophysical and geochemical techniques in a forthcoming international programme.

More than any other portion of the world ocean, the countries of the WESTPAC region, and especially the South Pacific area, are concerned with the future exploitation of offshore non-living resources. The IOC has recognized this and, in co-operation with various bodies, notably CCOP and CCOP(SOPAC), has established resource-related research programmes such as SEATAR (Post-IDOE Studies of East Asian Tectonics and Resources) and STAR (South Pacific Tectonics and Resources) and has co-operated in the holding of workshops. As OSNLR develops further impetus in the future there will be a need to develop more of these regional co-operative programmes that will focus on eustatic sea-level environmental and tectonic changes as a basis for future marine non-living resource exploration by the countries of the WESTPAC region and elsewhere.

MONSOON AND CURRENTS IN THE INDIAN OCEAN

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The Indian Ocean has the particularity of being closed to the north in contrast to the Atlantic and the Pacific Oceans. The presence of the continent thus generates one complete seasonal reversal of the atmospheric circulation to the north of about 10° latitude south; this is the regime of monsoons. The atmospheric circulation so specific of the Indian Ocean has also generated a specific oceanic response which makes the Indian Ocean a privileged area of the western Indian Ocean which receives the strongest seasonal oceanic variabilities as compared with other regions of the globe.

Unfortunately, this ocean has tended to be somewhat neglected in observation plans. The first large-scale programme of international exploration of this ocean was the International Indian Ocean Expedition, 1960-1965, initiated by SCOR and later co-ordinated by the IOC. Then, it was only in 1979 that a new international programme known as the First Global GARP Experiment (FGGE) brought together again many nations to undertake a common oceanographic programme initiated by a SCOR Working Group. Having described the general characteristics of the Indian Ocean in relation to its seasonal atmospheric cycle, a review will be made of the main results now obtained from these two large-scale international programmes concerning the upper circulation of this ocean. This will be followed by a description of recent studies since FGGE and others envisaged in the context of the large-scale international programmes co-ordinated by CCCO and IOC, namely, TOGA (Tropical Ocean and Global Atmosphere) and WOCE (World Ocean Circulation Experiment). The importance of the participation of countries of the region in these programmes has been stressed.

THE SCIENTIFIC BASIS FOR THE ASSESSMENT OF MARINE POLLUTION IN THE CARIBBEAN SEA AND ADJACENT REGIONS: THE CARIPOL EXPERIENCE

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Co-ordinated regional efforts in marine pollution monitoring in the Caribbean and adjacent areas were concentrated, initially, in the monitoring of petroleum pollution, using rapid and easy-to-use methods that are easily available to the greatest possible number of participants. The application of this criterion has allowed a large database to be assembled on the presence of tarballs on beaches (7 005 data), on floating tarballs (681) data) and on dissolved/dispersed hydrocarbons (1 461 data) in fourteen countries of the region.

The analysis of these data shows that pollution of beaches by floating tarballs is a serious problem in the Caribbean and the Gulf of Mexico. In particular, the leeward beaches of the Antilles Island Arc, of the Dutch Antilles and of the Cayman Islands receive large quantities of these materials in amounts that exceed 1 kilogramme per metre of beach front. In the latter two archipelagos, averages between 10 and 100 grammes are common. The Mexican beaches of the Caribbean, from the Campeche Sound and from the east coast of Florida, average levels between 10 and 100 grammes of tar are also found. The least affected zone so far seems to be the extreme south-western part of the Caribbean, except in the vicinity of major ports. The data on floating tarballs shows a regional average of 1.84 mg/m². Nevertheless, the distribution is uneven and some areas such as the eastern Caribbean have higher average concentration. Statistical analyses in the Puerto Rico area and the strait of Florida show that the presence of floating tarballs can be attributed approximatively 50 % to local tanker traffic, the remaining 50 % being attributable to sources outside the region. The analysis of dissolved/dispersed hydrocarbons shows an average of 1.26 µg/1 in the eastern Caribbean rising to an average of 12.58 in the north-western Caribbean. However, the high average concentration reported in some areas reflects the preferential sampling in areas of highest concentration, principally highly industrialized bays and estuaries.

Although there is little information on the effect of petroleum pollutants on marine organisms in the region, the work of Van Vleet and his collaborators shows clearly the impact on marine turtles. The chromatograms of petroleum residues ingested by specimens of these animals beached in Florida show that these residues come from tanker discharge. In the implementation of the second phase of the CARIPOL programme, the occurrence of hydrocarbons in sediments and organisms is being examined. Preliminary results of contaminated sediments samples in Puerto Rico indicate that, although the homologues aliphatic hydrocarbon fractions are rapidly degraded, the complexed mixtures of isomeric alkanes and aromatic hydrocarbons are more persistent.

Although these co-ordinated regional efforts have been concentrated so far on the problem of petroleum derivatives, there are other major pollution problems in the region. These include pollution by pesticides and heavy metals, eutrophication and the run-off of terresterial sediments. Of these, the latter two appear to have acquired a regional importance and will be the subject of detailed study, given their severe deleterious impact on coastal marine communities.

ANNEX VI /ANNEXE VI /ANEXO VI /ПРИЛОЖЕНИЕ VI / الملحق السابع / 附 件 VI

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ANNEX VII

LIST OF WORKING DOCUMENTS

IOC-XIV/1	Agenda
IOC-XIV/1 Add.	Timetable
IOC-XIV/2	Annotated Provisional Agenda
IOC-XIV/2 Corr.	Corrigendum to the Annotated Provisional Agenda
IOC-XIV/3	Summary Report of the Fourteenth Session of the Assembly, published in the Unesco Main Series Documents as SC/MD/86 (this document)
IOC-XIV/4 rev.	Revised List of Documents
IOC-XIV/5	List of Participants
IOC-XIV/6	Report of the Secretary on Intersessional Activities (January to December 1986)
IOC-XIV/6 Suppl.	List of Circular Letters, IOC Meetings, Meetings at which IOC was Represented, IOC Information Documents
IOC-XIV/7	Programme of Work and Financial Requirements
IOC/XIV/8	Action Paper
IOC-XIV/8 Add.	Addendum to the Action Paper on Agenda Item 4
IOC-XIV/8 Corr.	Corrigendum to the Action paper
IOC-XIV/8 Annex 1	Proposal on the Development of the IODE System in Response to Emerging New Requirements
IOC-XIV/8 Annex 2	(Cancelled)
IOC-XIV/8 Annex 3	Report on IOC Co-operation with SCOR and ICSPRO on the Joint Oceanographic Assembly, 1988
IOC-XIV/8 Annex 4	Proposal on the IOC Contribution to the Unesco Medium-Term Plan 1990-1995
IOC-XIV/8 Annex 5	Proposal on the IOC Programme of Work and Budget for 1988-89
IOC-XIV/8 Annex 6	Proposed Amendments to the Statutes

IOC-XIV/8 Annex 6 Add. 1 and Add. 2	Comments of IOC Member States and ICSPRO Organizations on the Proposed Amendments to IOC Statutes
IOC-XIV/8 Annex 7	Action Plan for the GIPME Programme
IOC-XIV/8 Annex 8	IOC and ICSU International Geosphere-Biosphere Programme: A Study of Global Change
IOC-XIV/8 Annex 8 Add.	Information on Developments with Regard to International Global Ocean Flux Studies
IOC-XIV/9	Draft Biennial Report of the Commission, 1985-1986
IOC-XIV/10	(Cancelled)
IOC-XIV/11	Report of the IOC Study Group on Measures to Strengthen the Co-ordination of the Programme Activities of Unesco's Division of Marine Sciences and the IOC
IOC-XIV/12	Measures Needed to Ensure Adequate and Dependable Resources for the Commission's Programme of Work

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N.B. THIS LIST IS FOR REFERENCE ONLY. NO STOCKS OF THESE DOCUMENTS ARE MAINTAINED.

ANNEX VIII

LIST OF ACRONYMS AND ABBREVIATIONS

ACMRR	Advisory Committee on Marine Resources Research
AGU	American Geophysical Union
ALECSO	Arab League Educational, Cultural and Scientific Organizations
ASEAN	Association of South-east Asian Nations
ASFA	Aquatic Sciences and Fisheries Abstracts
ASFIS	Aquatic Sciences and Fisheries Information System
BATHY/TESAC	Bathythermograph Report/Temperature, Salinity, Currents
BGI	Bureau Gravimétrique International
CAP	Circum-Atlantic Project
CARIPOL	Caribbean Component of GIPME/MARPOLMON
CBS	Commission for Basic Systems
CCCO	Joint SCOR-IOC Committee on Climatic Changes and the Ocean
CCOP	Committee for the Co-ordination of Joint Prospecting for Mineral Resources in Asian Offshore Areas
CCOP(SOPAC)	Committee for the Co-ordination of Joint Prospecting for Mineral Resources in South Pacific Offshore Areas
CGOM	Consultative Group on Ocean Mapping
CIAC	Cephalopod International Advisory Council
CMM	Commission for Marine Meteorology
COMAR/COSALC	Unesco Major Interregional Project on Research and Training Leading to the Integrated Management of Coastal Systems/COMAR Regional Component for Latin America and the Caribbean
CPPS	Comisión Permanente del Pacífico Sur
CZAR	Coastal Zone as a Resource

DBCP	Drifting Buoy Co-operation Panel
DNA	Declared National Agency
DOD	Deutsches Ozeanographisches Datenzentrum (Germany Fed. Rep.)
ECOR	Engineering Committee on Oceanic Resources
ECOSOC	Economic and Social Council
ERFEN	Estudio Regional del Fenómeno `El Niño'
FAO	Food and Agricultural Organization of the United Nations
FGGE	First GARP Global Experiment
GAPA	International Geological/Geophysical Atlases of the Atlantic and Pacific Oceans
GARP	Global Atmospheric Research Programme
GEBCO	General Bathymetric Chart of the Oceans
GEEP	Group of Experts on Effects of Pollutants
GEMIM	Group of Experts on Marine Information Management
GEMSI	GIPME Group of Experts on Methods, Standards and Intercalibration
GESAMP	Group of Experts on the Scientific Aspects of Marine Pollution
GESREM	Group of Experts on Standards and Reference Materials
GF-3	IOC General Format No. 3 (International Oceanographic Data Exchange)
GIPME	Global Investigation of Pollution in the Marine Environment
GLORIA	Geological Long-range Inclined ASDIC
GLOSS	Global Sea-Level Observing System
GOFS	Global Ocean Flux Study
GPS	Global Positioning System
GTS	Global Telecommunication System

IABO	International Association for Biological Oceanography
IAEA	International Atomic Energy Agency
IAPSO	International Association for the Physical Sciences of the Ocean
IBCEA	International Bathymetric Chart of the Central Eastern Atlantic
IBCCA	International Bathymetric Chart of the Caribbean Sea and Part of the Pacific off Central America
IBCM	International Bathymetric Chart of the Mediterranean and Overlay Sheets
IBCWIO	International Bathymetric Chart of the Western Indian Ocean
ICES	International Council for the Exploration of the Sea
ICSEM	International Commission for the Scientific Exploration of the Mediterranean Sea
ICSPRO	Inter-Secretariat Committee on Scientific Programmes Relating to Oceanography
ICSU	International Council of Scientific Unions
IDOE	International Decade of Ocean Exploration
IGBP	International Geosphere-Biosphere Programme
IGCP	International Geological Correlation Programme
IGOSS	Integrated Global Ocean Services System
IHB	International Hydrographic Bureau
IHO	International Hydrographic Organization
IMO	International Maritime Organization
IMS	International Marine Science Newsletter
INMARSAT	International Organization for a Maritime Satellite System
IOCARIBE	Sub-Commission for the Caribbean and Adjacent Regions
IOCEA	IOC Regional Committee for the Central Eastern Atlantic

IOCINCWIO	IOC Regional Committee for the Co-operative Investigations in the North and Central Western Indian Ocean
IOCINDIO	IOC Regional Committee for the Central Indian Ocean
IODE	International Oceanographic Data Exchange
IOS	Institute of Oceanographic Sciences
IREP	International Recruitment Programme
ITIC	International Tsunami Information Centre
ITSU	Tsunami Warning System in the Pacific
IUGS	International Union of Geological Sciences
JGOFS	Joint Global Ocean Flux Study
JOA	Joint Oceanographic Assembly
JODC	Japan Oceanographic Data Centre
LEPOR	Long-term and Expanded Programme of Oceanic Exploration and Research
MAP	Margins of Active Plates
MARPOLMON	Marine Pollution Monitoring System
MEDI	Marine Environmental Data Information Referral System
MEDS	Marine Environmental Data Service
MIM	Marine Information Management
NODC	National Oceanographic Data Centre
NOP	National Oceanographic Programme
NROSS	Navy Remote Ocean Sensing System
ODAS	Ocean Data Acquisition Systems
ODP	Ocean Drilling Programme
OMLET	Ocean Mixed Layer Experiment
OPC	Ocean Processes and Climate
ORSTOM	Office of Overseas Scientific and Technical Research

OSLR	Ocean Science in Relation to Living Resources
OSNLR	Ocean Science in Relation to Non-living Resources
PERSGA	Programme on the Environment of the Red Sea and the Gulf of Aden
PSMSL	Permanent Service for Mean Sea Level
RFS	IOC Research Fellowship Scheme
RNODC	Responsible National Oceanographic Data Centre
ROPME	Regional Organization for the Protection of the Marine Environment
ROSCOP	Report on Observations/Samples collected by Oceanographic Programmes
ROSTs	Regional Offices of Science and Technology
SARP	Sardine/Anchovy Recruitment Project
SCGB	Special Committee for the Geosphere-Biosphere
SCOR	Scientific Committee on Oceanic Research
SEATAR	Joint CCOP-IOC Working Group on post-IDOE Studies of East Asian Tectonics and Resources
SECTIONS	Energetically Active Zones of the Ocean (EAZO) and Climate Variability
SET	Sea level, Environments and Tectonics
SETMY	Sea Level, Environments and Tectonics in the Past Million Years
SETR	Eustatic sea-level changes, Tectonics and Resources
SOCs	Specialized Oceanographic Centres
SPAN	Space Physics Analysis Network
STAR	Joint CCOP(SOPAC)-IOC Working Group on South Pacific Tectonics and Resources
SUS	Shelf and Upper Slope
TEMA	Training, Education and Mutual Assistance in the Marine Sciences
TESAC	Temperature, Salinity, Currents

TOGA	Tropical Oceans and Global Atmosphere
TOPEX/POSEIDON	Ocean Topography Experiment
TRODERP	Tropical Demersal Recruitment Project
UN	United Nations
UN(OETB)	UN Ocean Economics and Technology Branch
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
VCP	IOC Voluntary Co-operation Programme
VLBI	Very Long Baseline Interferometry
WATS	Western Atlantic Turtle Symposium
WCRP	World Climate Research Programme
WESTPAC	IOC Regional Committee for the Western Pacific
WMO	World Meteorological Organization
WOCE	World Ocean Circulation Experiment
XBT	Expendable bathythermograph